AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

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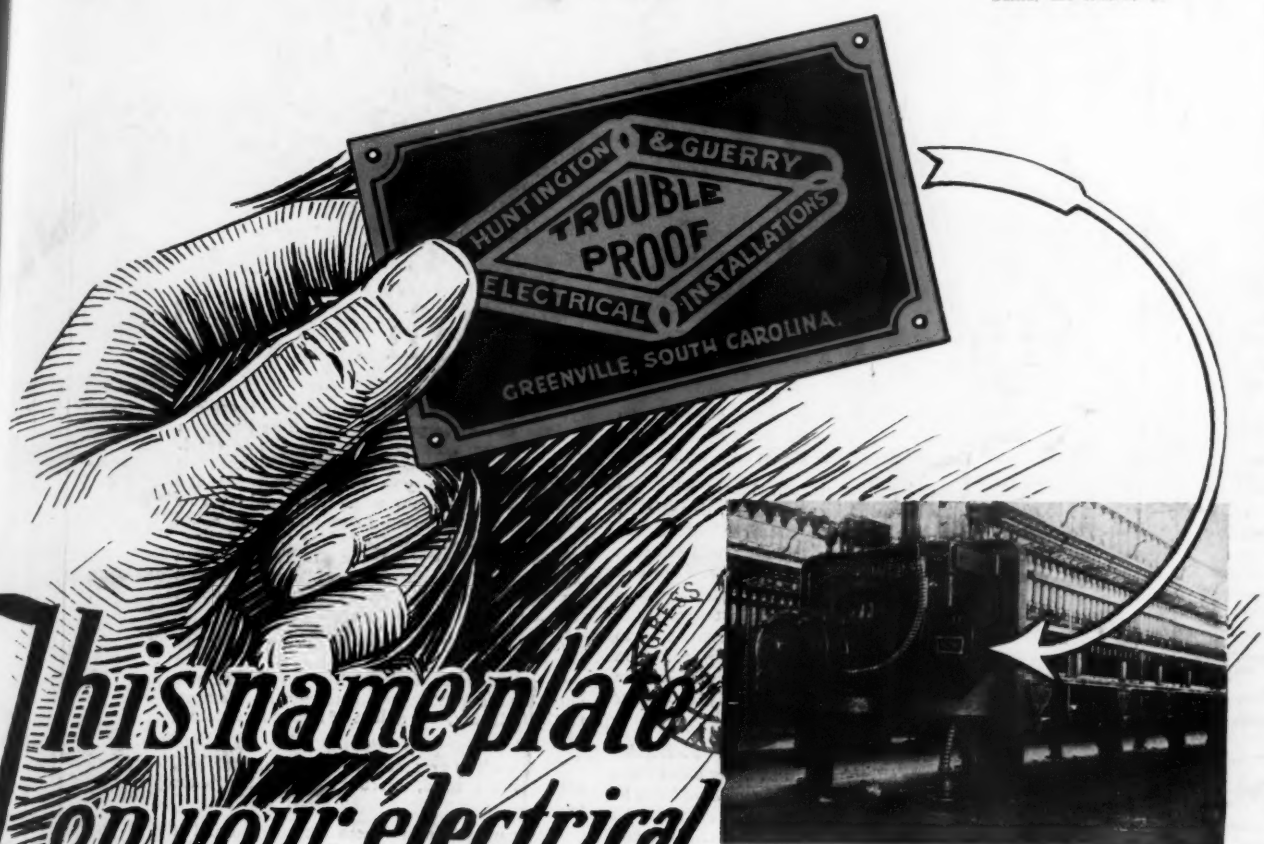


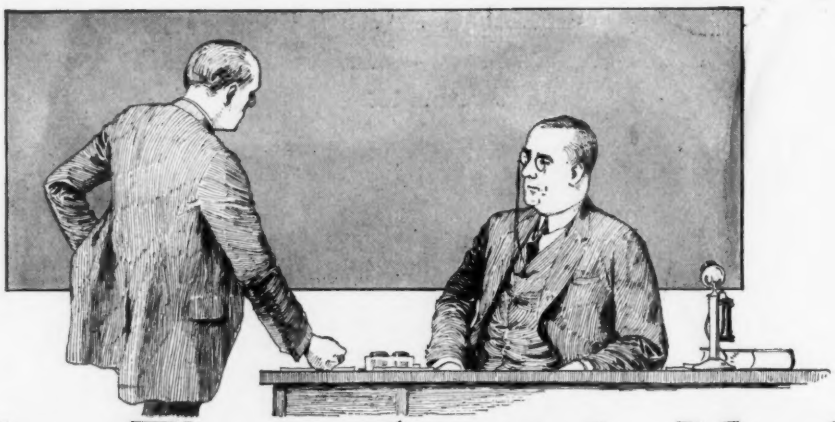
This name plate on your electrical system means —

1. Maximum value and economy in first cost.
2. Maximum life of the equipment through years of service.
3. Minimum lost time through failure during operation.
4. Maximum safety of your employees in operating.
5. Complete co-operation in the solution of your problems.
6. Gentlemanly and efficient workmen whom you will be glad to have return on other work.

The owners of more than 2,000,000 Southern Cotton Mill Spindles and 70 Industrial Villages employing our services testify to these facts

HUNTINGTON & GUERRY, INC., GREENVILLE, S. C.

H & G TROUBLE-PROOF ELECTRICAL INSTALLATIONS



I'm Through with You!

SOMETIME, some customer says this to all of us. The problem is to keep this list of "deserters" down to a minimum.

To colored goods manufacturers who are continually harassed by customers, dissatisfied because of late deliveries, the Franklin Process of dyeing offers a service which will effect a solution for many of their difficulties. We can always make deliveries in ten days to two weeks and when the occasion demands in two or three days. In fact if customers will instruct us to purchase a surplus stock of grey yarn for them and store it in our plant or if they will ship yarn to us for storage, we can regularly do better than a week.

Customers sometimes wind yarn to Franklin springs before shipping and in other cases have us do the winding. Thus they always have in our plant a surplus stock of grey yarn all prepared for dyeing. Yarn in this form can be put through our dyeing department in a few days.

When it reaches the manufacturer, there are no long chain warps to beam. The Franklin Dyed packages fit directly into the V creel. Beamers are useless equipment in mills that use our service. Are you still paying for the operation of beamers when you could throw them out? You wind from bobbin to spool and from spool to warp before warp dyeing. Before Franklin dyeing you simply wind from bobbin to Franklin package. Are you still paying for two operations when you could reduce them to one?

And the quality of Franklin dyeing is in many cases actually noticeably better. Franklin dyeing is done in a closed kier under pressure and with the most concentrated dye bath known to the industry,— a gallon of liquor to a pound of yarn.

The result is greater penetration of the yarn, giving more solid, more brilliant and faster colors.

You can determine these facts first hand if you examine our samples. They are yours for the asking. Write today.

FRANKLIN PROCESS COMPANY

Yarn Dyers · Yarn Merchants · Mfrs Glazed Yarns · Dyeing Machines

Philadelphia · PROVIDENCE · Manchester, Eng.

New York Office 72 Leonard St.

SOUTHERN FRANKLIN PROCESS COMPANY

Greenville, S. C.

Taking a Chance
It Is Just As Good

The Northrop Loom was the pioneer automatic loom. Its sponsors risked all they had in the world to make it a success.

They won because they had the right idea and were willing to see it through;

But not until they had continued to spend and take chances while they were perfecting the invention.

Their success brought a complete revolution in the Textile Industry in America.

It brought also imitators.

Meanwhile liberal spending for the development of the art of weaving and improvement of textile manufacturing processes has continued a fixed policy with the company that produced and perfected the Northrop Loom.

This liberal spending has built upon the original organization the largest and most experienced corps of experts, inventors, experimenters and practical loom-builders the industry has ever known.

This corps of trained and practical men has always kept the Northrop loom at the front—a money-maker for the mill man, a benefactor of the mill worker, equal to the demands upon its mechanisms of every new weave for which it was purchased.

This corps of trained and practical men is stronger and more efficient than ever before—better qualified to serve the industry.

Imitators claim all sorts of things for their machines; and the purchaser "hopes" they will prove "just as good."

DRAPER CORPORATION

Southern Office Atlanta Georgia **Hopedale Massachusetts**

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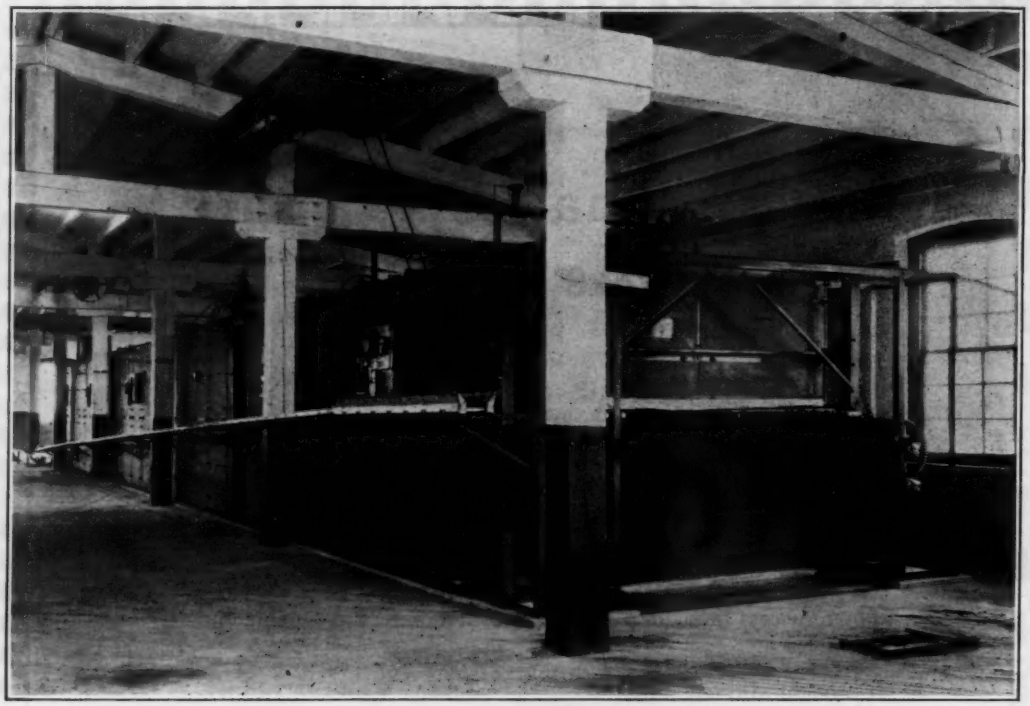


The "Proctor" Automatic Yarn Drying and Conditioning Machine

Dry, Cool and Condition Yarn in One Automatic Handling

To definitely control the required amount of moisture in skein yarn dried for any purpose, install the "Proctor" Automatic Yarn Drying and Conditioning Machine.

In this machine the yarn passes through three consecutive compartments—in the first it is uniformly dried; in the second, it is cooled; in the third, it is given back the amount of moisture desired. The yarn is uniformly penetrated with moisture, the amount being regulated by automatic conditioning apparatus.

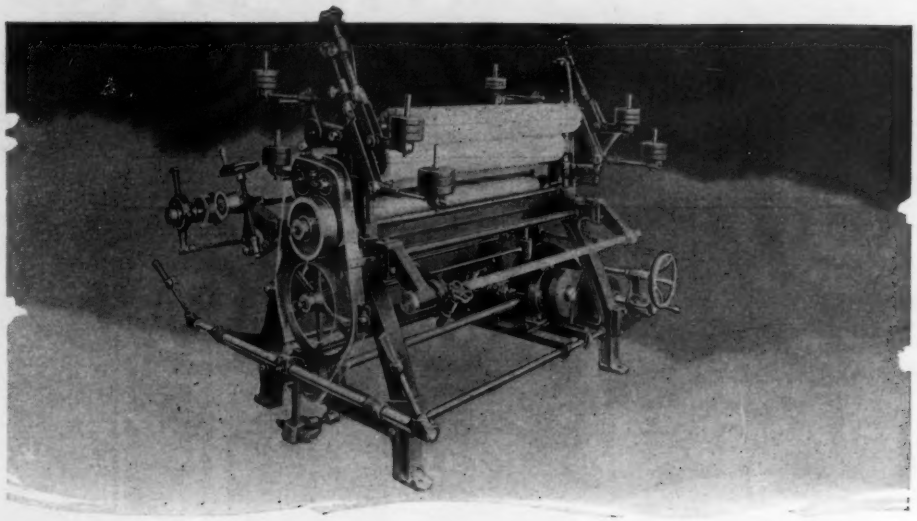
Besides insuring the right condition and feel of the yarn, this "Proctor" machine is by far the most efficient and economical equipment for its purpose. The entire process is a continuous and automatic one—saving time, labor and space—reducing cost to the lowest possible level. Let us acquaint you with its advantages as applied to your particular needs.

"Proctor" Dryers for Every Drying Need-- "Smith-Furbush" Felting, Shoddy and Waste Machinery

PROCTOR & SCHWARTZ, INC.

PHILADELPHIA

SKF



Ball Bearing Equipped Expanders
Insure Better Work—Increase Production

WEAR of plain bearings on rollers and expanders is soon reflected in the quality of finished product. On the expander shown, the rollers and expanders run on Skayef self-aligning ball bearings, eliminating uneven operation and insuring better work.

Plain bearings require frequent oiling and much of the oil works onto rollers and expanders with consequent damage to cloth. Sealed housings of Skayef self-aligning ball bearings prevent lubricant leakage, keep machines and floor clean.

Skayef self-aligning ball bearings are practically frictionless, even under conditions of misalignment, run freely at all times, and expanders so equipped require less power to operate.

Freedom from constant maintenance, power savings, better work and cleanliness of workrooms are a few features of ball bearings which have caused them to be adopted for all kinds of textile machinery. Our engineers will gladly submit recommendations for your particular needs on request.

THE SKAYEF BALL BEARING COMPANY

Supervised by SKF INDUSTRIES, INC., 165 Broadway, New York City

1133

Normal View *Deflected View*

FAFNIR

FAFNIR
Double Ball Bearing
Hanger Box

MORE EFFICIENT KNITTING MACHINE DRIVES

This is a partial view of one group of knitting machines used in the manufacture of seamless hosiery at the plant of H. K. Regar & Sons, Bridgeport, Pa.

The drive shafts for these groups of knitting machines are mounted on *Fafnir Ball Bearing Hanger Boxes*, a double bearing box being used at the end of each shaft next to the motor, and single bearing boxes at other points of support.

This kind of drive affords a splendid opportunity to install *Fafnir Ball Bearing Boxes* and save power, time and oil, to say nothing of greatly reducing the wear and tear on belts and general maintenance.

THE FAFNIR BEARING COMPANY

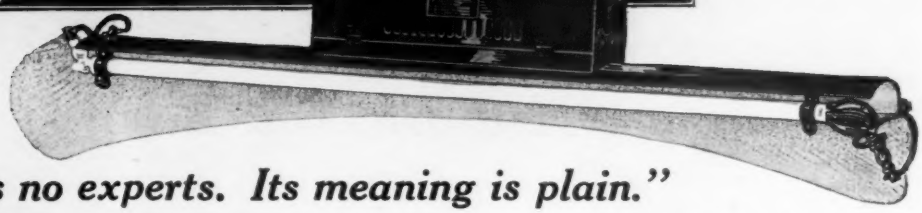
New Britain, Conn.

Southern Representatives

O. R. S. POOL,
Charlotte, N. C.

A. G. LAUGHRIDGE,
P. O. Box 1847, Atlanta, Ga.

A day shift and a night shift under Work-Light solved a ticklish problem for one large New England mill. A new building, aimed to double capacity, had been planned to meet increasing demand. Work-Light, enabling night operation with efficiency at the daytime level, solved the problem with no additional investment in building or machines.



"It needs no experts. Its meaning is plain."

Light from the manufacturer's viewpoint—that's the Work-Light book. Thirty-two pages of practical, quickly given information—with pictures of actual installations in a wide variety of plants. Any executive who wants to be fully equipped to contend with the ever-present problems of production and costs should arrange now to spend half an hour with this book. Send in your name today.

"GO ahead and schedule the job, Dixon. Yes, I know you'll have to run nights for three or four hours. Overtime has been figured in the price we bid, even if we did shave it down a little. But we had to figure close or get out of the picture. We're having to draw things finer for every job we do."

Here the sales manager spoke up.

"It's going to eat up our margin to pay overtime, Mr. Franklin. But we simply had to get this order. This Wilkins-Jones chain store crowd offer one of the biggest outlets in our line. It's worth something to be on speaking terms with them, even if we only break even on this first job."

"Well, it'll keep the works turning over," consoled Dixon, the factory manager. "We could make a nice profit, though, if we could turn things out on the night trick as fast as we do during the day. And if we could take that afternoon sag out of the production curve, we'd have a lot less overtime to pay."

The president came out of one of those "brown studies" of his.

"Patience is a virtue," he exclaimed, "but hanged if I'm not getting weary of running a factory just for exercise. Here's a little thing I read the other day, and it has made me think. For one thing, it's showed me why this night production problem isn't a necessary evil at all. It has shown me that it can be stopped, and stopped so as to help straighten your production curve during the day."

"What's it all about?" queried Dixon. "Another time-study plan some expert has doped out?"

"That's just what it is not," the president came back. "You can read this thing and get it all in half an hour. It does it by getting down to cases about factory light and discussing it in terms of work. Both of you'd better read it. It needs no experts. Its meaning is plain."

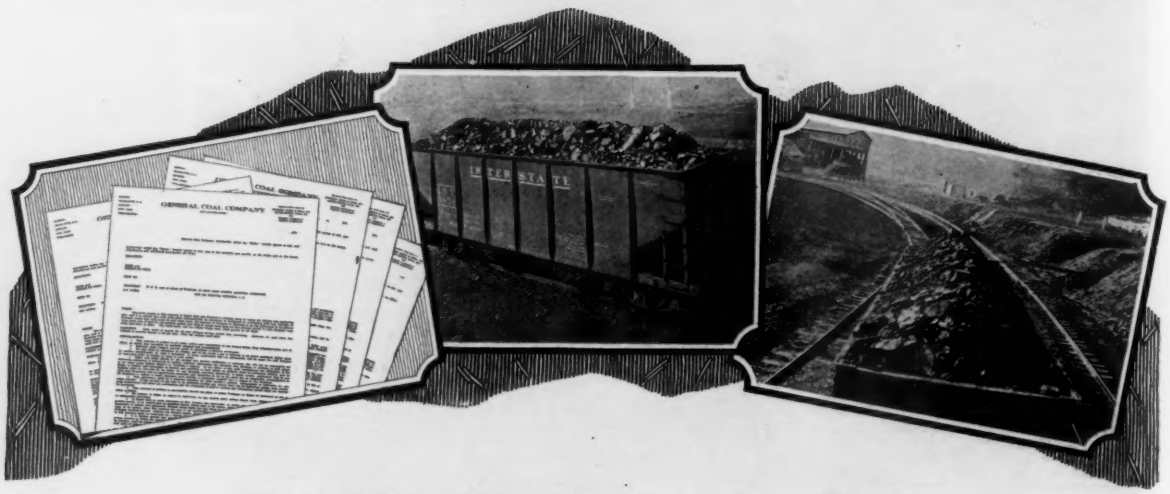
A half hour of simple text and expressive pictures. That's the Work-Light book—showing that the quality of light, as well as its quantity, determines what you get out of light. Send for your copy of "Work-Light" today. Cooper-Hewitt Electric Co., Hoboken, N. J.

89 River Street.

COOPER HEWITT

Work-Light

17 © C. H. E. Co. 1924



Price? Service? Quality? How Do You Buy?

STONEGA

Steam and By-Product Coal

Every user of coal must have one or more reasons for the kind of coal he uses. Price, service or quality—or all three together—are the determining factors of the purchase.

If, with you, it is *price*—what greater economy is there than a contract with the General Coal Company that guarantees a stable figure regardless of strikes, tie-ups, or current market prices?

RODA

Gas and By-Product Coal

Admiralty Coal

New River Smokeless

If *service* is the main issue—consider the fact that General Coal Company provides quick shipment over three trunk lines to all industrial centers of the South and East. Moreover, our combustion engineers are at your disposal to assist you in getting the best results from your fuel.

DEPENDABLE COAL

Finest Anthracite

If the deciding point is *quality* remember this—85% of General Coal Company's customers renew their contracts year after year because their lowered steam production costs are positive proof that *our fuels produce greater boiler room efficiency for less money.*

Our nearest office will gladly consult with you regarding your fuel problems.

GENERAL COAL COMPANY

1727 Land Title Building
PHILADELPHIA

BUNKER COAL

Supplied at

Baltimore, Md.
Charleston, S. C.
Jacksonville, Fla.
Norfolk, Va.
Savannah, Ga.

BOSTON
CHARLESTON
CHARLOTTE

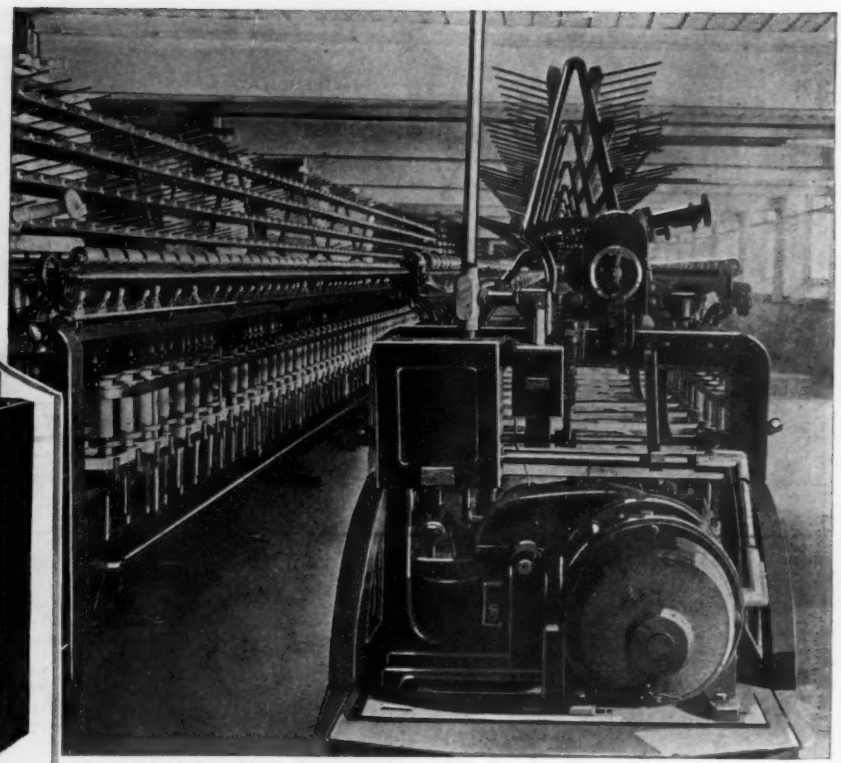
EXCLUSIVE SALES AGENT
—FOR—
STONEGA COKE & COAL CO.
HAZLE BROOK COAL CO.
—AND—
SUCCESSOR TO BUSINESS OF
WENTZ COMPANY

DETROIT
NEW YORK
NORFOLK

EXPORT & COASTWISE COAL

Loaded at

Baltimore, Md.
Charleston, S. C.
Norfolk, Va.



CR7006 Switch

Easy to operate
Start and stop by shipper rod

Safety for operator
Electrical parts are all enclosed—under-voltage protection provided

Protection for motor
Relay closely follows motor heating curve

Durable Contactors
Solid copper—heavy spring pressure—long life tips

Easily installed
Ample wiring space—readily mounted

General Electric Co.
Schenectady, N. Y.
Mill Power Dept., 84 State Street, Boston, Mass.

You START RIGHT with the CR7006 Magnetic Switch

The right start is a sure start. That is why G-E CR7006 Magnetic Starting Switches are on these machines.

They save time, and increase production—for they quickly and surely start and stop the machines as operators desire.

The CR7006 Switch has a temperature overload relay which closely follows the heating curve of the motor. This prevents any unnecessary shut-downs, either in starting or running—for *only* the overloads which are dangerous to the motor make the switch stop the machine.

Low Price—Stock Shipment

Ask the G-E sales office in any large city for complete information on the CR7006 Starting Switch for small a-c. motors.

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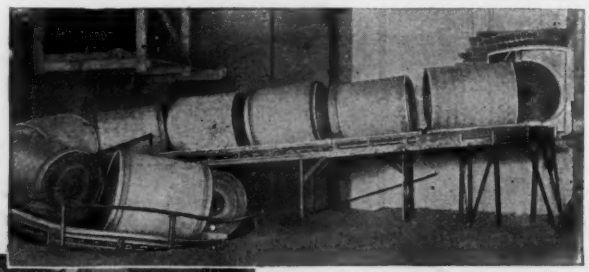
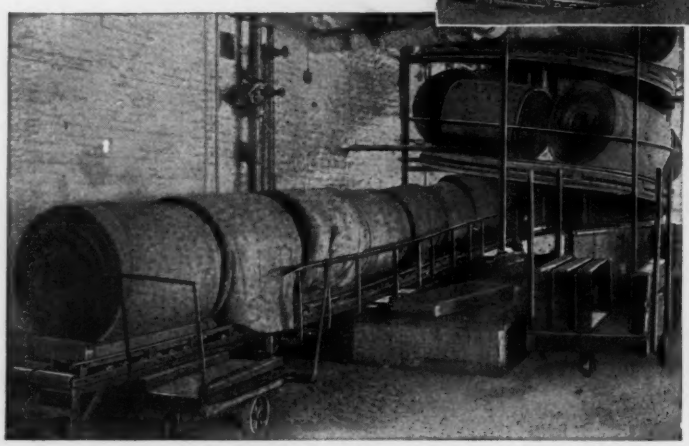
GENERAL ELECTRIC

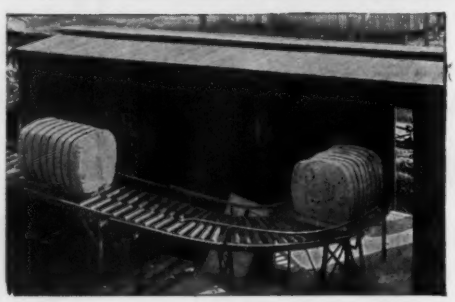
DO IT WITH GRAVITY





At the Arnold Print Works.

Link your Departments Together Without Labor or Power



At the Cherry Cotton Mills.

THE labor or power you are now using in carrying, wheeling or trucking materials to or from cars and from one department to the other, CAN BE SAVED. "Do it with power" is well meant, but power costs money. Now, they "Do it with gravity" and save BOTH labor and power. There's a big supply of latent energy, called gravity, waiting to be harnessed and put to work in your mill. Why not use it—it costs nothing?

MATHEWS GRAVITY ROLLER CONVEYER

Put the Mathews Gravity Roller Conveyer to work. Let it unload or load the cars or carry your cotton or cotton goods, bales, cases, bags, piece goods or other products from one department to the other, without the use of labor or power—with no waiting for materials, no confusion, no time lost.

The Mathews has proved itself in many mills—it is no experiment. Its steel, ball-bearing rollers respond even in the most gentle inclines or long stretches of trackage. Regardless of the conditions in your mill a Mathews Conveyer can be adapted to it and assures you a saving of from 50 to 70% in time and labor. It can be fitted either sectionally or permanently.

Our representative in your locality will gladly call on you and plan a Mathews System best suited to your conditions. Why not find out the advantages and savings which can be assured you with a Mathews system—it won't cost you anything and you will be under no obligation. Write us today for full information.

Mathews Automatic Elevators eliminate the necessity for large freight elevators or operators. It will automatically receive from or discharge to any number of floors. Relieves congestion,—keeps goods moving.

MATHEWS CONVEYER COMPANY

(formerly Mathews Gravity Carrier Co.)

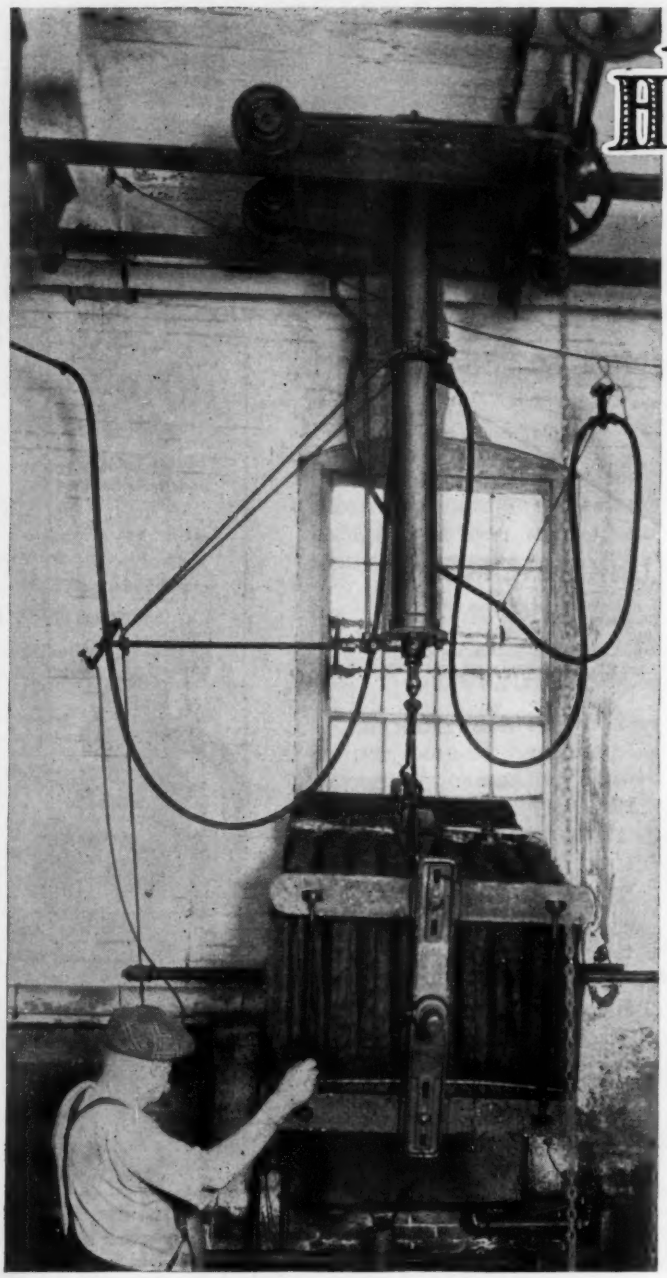
162 TENTH ST., ELLWOOD CITY, PA.

Sales Engineers in All Important Cities.

Other Mathews products include Inclined Elevators, Spiral Chutes, Straight Chutes, Apron Conveyers, Belt Conveyers and roller specialties of various kinds.

CURTIS

AIR HOISTS



Used in The Textile Industry

Curtis one man All Steel Air Hoists and Curtis Roller Bearing Trolleys are effecting important economies in leading textile mills throughout the country.

Why not install a Curtis Air Hoist and operate it with the air you now have available? The wide variety of uses to which Curtis equipment can be most economically applied is worthy of your immediate investigation.

Curtis Pneumatic Machinery Company

1571 Kienlen Ave., St. Louis, Mo.

Branch Office

532-R Hudson Terminal, New York

CURTIS
AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES
ST. LOUIS
Established 1854

LUNKENHEIMER

Pop Safety and Relief Valves

A most extensive line of a large number of designs, made in various combinations of materials, permitting of a broad selection for any service, pressure or temperature.

Reliable, durable and economical in operation.

Write for literature 502-584.-AK

THE LUNKENHEIMER CO.
"QUALITY"
LARGEST MANUFACTURERS OF HIGH GRADE ENGINEERING SPECIALTIES IN THE WORLD
NEW YORK CHICAGO CINCINNATI, U.S.A. BOSTON LONDON
EXPORT DEPT. 129-135 LAFAYETTE ST., NEW YORK

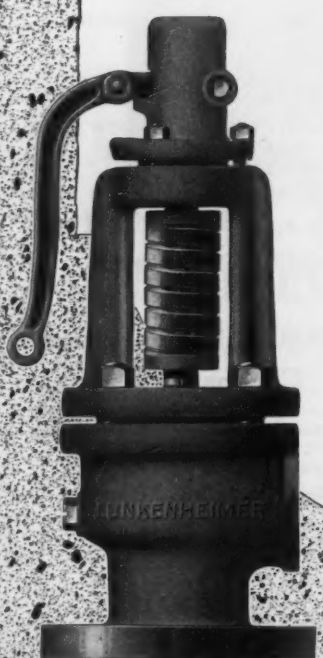


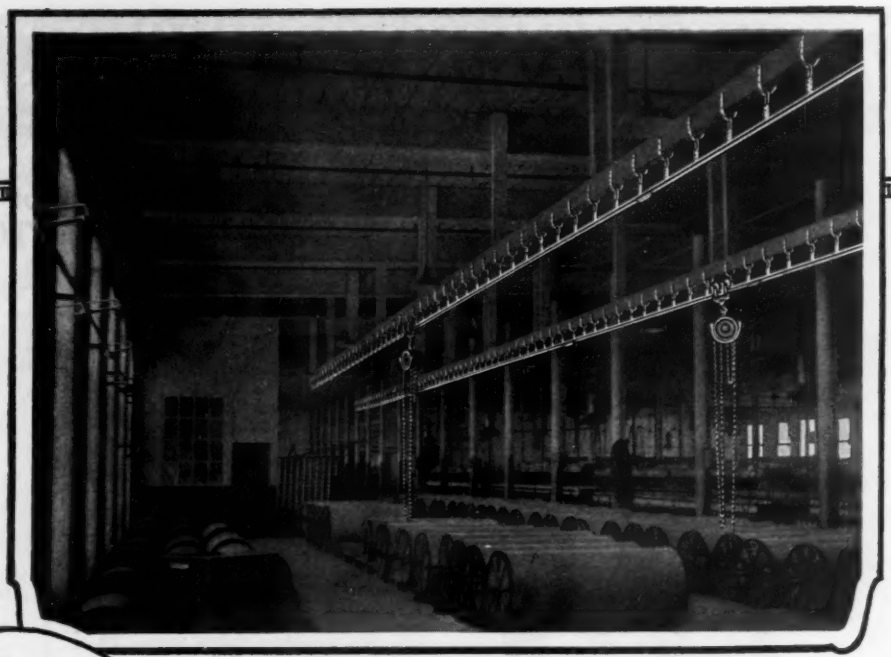
Fig. 146
Iron Body Bronze Mounted
Outside Spring
Pop Safety Valve

Fig. 433
Bronze Encased Spring
Top Outlet
Pop Safety Valve

Fig. 656
Bronze Encased Spring
Top Outlet
Cylinder Relief Valve

Fig. 630
Iron Body Bronze Mounted
Encased Spring
Pop Safety Valve

4-23-10



Lanett Cotton Mills, West Point, Ga., equipped with Louden Overhead Carrying System. Stacking warp beams on platform.

Loads Up To 2000 Lbs.

Are easily handled by the Louden Overhead Carrying System—

From department to department—

From building to building—

Under any conditions.

The Louden Overhead Carrying System can be used for:

Conveying bales of cotton from warehouse to opening room.

Conveying warp beams to slashers for sizing and on to storage racks and looms.

Conveying raw cotton after dyeing, from kettles to storage rooms, and on to picker machines.

Conveying finished products from finishing departments to warehouses. Either inside of cases or in bales.

Handling machinery in machine shops or equipment in garages.

Moving coal, ashes, repair or building material.

For practically every load moving job in and around the mills.

By lowering operative costs the Louden Overhead Carrying System increases earnings.

It will pay you to investigate.

For a Larger Percentage of Profit

When you figure the high cost of lifting loom and section beams by hand, the breakage of beam heads, accidents to the men, loss of time, delays, etc., it is not difficult to see why so many mills are now using the

LOUDEN

OVERHEAD CARRYING SYSTEM

The illustration above shows how this system is used in the warper room of the Lanett Cotton Mills, West Point, Ga., for the storage of beams. Any beam desired is quickly and easily picked up and taken out. The Overhead System, which has done away with getting beams out by rolling them over the others by hand, is also used in front of the slashers to assist the men in doffing.

Practically every load lifting job about the mill, from coal handling to shipping platform, can be done quickly and cheaply with this equipment. Its easy adaptability to turns, corners, routing under line shafting and over machines and to all mill conditions is one of its most distinctive features.

The cost of Louden Overhead Carrying Equipment is so low that its savings wipe out the investment charge in just a few months. This is a point that impresses everyone who really looks into the possibilities of its use.

Let us suggest how this equipment could be used to profitable advantage in your mill. Investigate, without obligating yourself. Write for a copy of our illustrated catalog.

The Louden Machinery Company

553 West Ave. (Established 1867) Fairfield, Iowa

Albany Boston New York Philadelphia Buffalo Pittsburgh Cincinnati Cleveland Chicago St. Paul San Francisco Los Angeles

Let Us Add Your Name To This List

OUR service to textile mills is the result of years of experience in installing textile theatre equipment. Our representatives call upon the mills personally, lay out the plans, advise on the proper equipment required and finally supervise the installation and the starting of the theatre. In other words, they take the whole problem off your hands and do not turn over the work to you until the theatre is operating satisfactorily.

The textile industry is demanding the best moving pictures for their employees and that is why they regularly specify POWER'S PROJECTORS.

That is why more Power's Projectors are used by textile mills in the South than all other projectors combined.

We carry a complete line of supply parts and equipment at our various branches. Your orders for supply parts will be filled the same day the order is received. Whatever are your needs for your theatre, we can supply them.

We have a special offer for Textile Mills. May we present it to you?

Satisfied Users of POWER'S PROJECTORS

ALABAMA

W. A. Handley Mfg. Co. ..... Roanoke
Tallassee Mills ..... Tallassee
Fairfax Mill ..... Fairfax
Avon Mills ..... Sylacauga
Lanett Cotton Mills ..... Lanett
Indian Head Mills ..... Cordova
Selma Mfg. Co. ..... Selma
Buck Creek Cotton Mills ..... Siluria

GEORGIA

Elm City Cotton Mills ..... LaGrange
Bibb Mfg. Co. ..... Porterdale
Roswell Mfg. Co. ..... Roswell
Gainesville Cotton Mill ..... Gainesville
Bibb Mfg. Co. ..... Columbus
Pacolet Mfg. Co. ..... New Holland
Manchester Cotton Mills ..... Manchester
Milstead Mfg. Co. ..... Milstead
Thomaston Cotton Mills ..... Thomaston
Exposition Cotton Mill ..... Atlanta
Habersham Mill ..... Habersham
Trion Company ..... Trion
Union Point Mfg. Co. ..... Union Point
Hillside Cotton Mill ..... LaGrange

NORTH CAROLINA

Durham Hosiery Mills ..... Durham
Pamona Mills ..... Greensboro
Cleveland Mill & Power Co. ..... Lawndale
Rodman-Heath Cotton Mills ..... Waxhaw
Rocky Mount Mills ..... Rocky Mount
Cherokee Falls Mfg. Co. ..... Cherokee Falls
Roxboro Cotton Mills ..... Roxboro
Consolidated Textile Corp. ..... Burlington
Carolina Cotton & Woolen Mills ..... Spray
Erwin Cotton Mills ..... Duke
Cannon Manufacturing Co. ..... Kannapolis

SOUTH CAROLINA

Baldwin Cotton Mills ..... Chester
Tucapau Mills ..... Tucapau
Ware Shoals Mfg. Co. ..... Ware Shoals
Glenn-Lowry Mfg. Co. ..... Whitmire
Monaghan Mills ..... Greenville
Drayton Mills ..... Spartanburg
Victor Mills ..... Greer
Conestee Mills ..... Conestee
Kershaw Cotton Mills ..... Kershaw
Abbeville Cotton Mills ..... Abbeville
Chesnee Mills ..... Chesnee
Union-Buffalo Mills ..... Buffalo
Victor-Monaghan Mills ..... Seneca
Victor-Monaghan Mills ..... Jonesville
Pacolet Mfg. Co. ..... Pacolet
Arogon Mills ..... Rock Hill
Graniteville Mfg. Co. ..... Vancluse
Woodside Cotton Mills ..... Greenville
Orr Cotton Mills ..... Anderson
Issaqueena Mills ..... Central
Clifton Mfg. Co. ..... Clifton
D. E. Converse Co. ..... Glendale
Winnsboro Mills ..... Winnsboro
Monarch Mills ..... Lockhart
Republic Cotton Mills ..... Great Falls

Southern Theatre Equipment Company

WILLIAM OLDKNOW, President.

100 WALTON STREET
ATLANTA, GEORGIA

THREE TWENTY-EIGHT CALIFORNIA ST.
OKLAHOMA CITY, OKLA.

1907 COMMERCE ST.
DALLAS, TEXAS

Tennessee—The Heart of Industrial America

The Kind of Labor That is Loyal and Stable

Labor, one of the biggest problems of the textile mill in other sections of the country, is a simple matter in Tennessee.

There, the labor supply is native-born, pure American stock, chiefly from the mountains, strong healthy men, women and children, who, hardened to the rough work in their mountainous homes, regard the life of a mill operative as one of comparative ease and the work interesting. These people are of much higher type morally than the element in other industrial sections. They are naturally intelligent, easily trained, and develop a high degree of efficiency. They are home loving people and show no inclination to migrate to other sections, preferring to remain in their native hills and with their own kind. They are extremely loyal and respond quickly to fair treatment. Although they are people of pride and cannot be driven or intimidated, they are the kind that quickly resent a word against their employers and stick to them through thick and thin. They prefer peace and contentment to any troublesome labor disturbances. Speaking and thinking the same language, there is an atmosphere of contentment that cannot be found elsewhere.

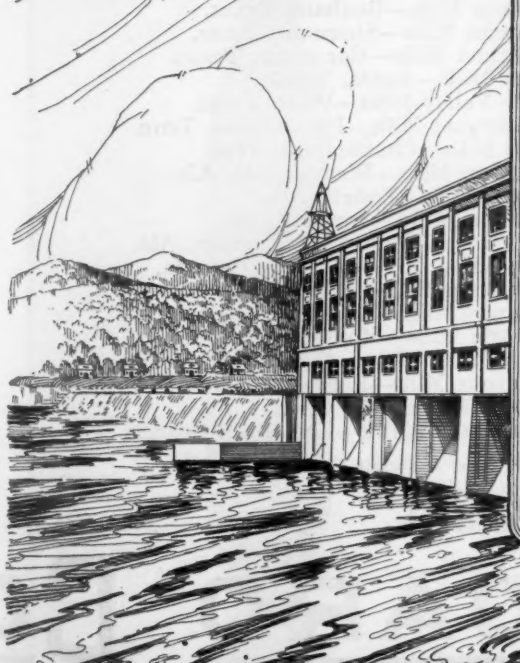
They are content to work for less because they can live for less in Tennessee. The mild climate requires less to be spent for heat, shelter, heavy foods and clothing. The long growing season provides foodstuffs and fresh vegetables the year round at lower prices.

The labor supply has hardly been touched in Tennessee. It is at your command if you locate your mill or branch plant there.

Ask us for full information about Tennessee and its many industrial sites and numerous advantages to industry.

THE TENNESSEE ELECTRIC POWER CO.

CHATTANOOGA,
TENN.



The Tennessee Electric Power Co.

THE FUN-FUL LINE

PLAYGROUND EQUIPMENT

349 Cotton Mills Using FUN-FUL!

A few of them

Pacific Mills—Columbia, S. C.
Columbia Mills—Columbia, S. C.
Wymojo Mills—Rockhill, S. C.
Woodside Mills—Greenville, S. C.
Pacolet Mills—Pacolet, S. C.
Drayton Mills—Spartanburg, S. C.
Monarch Mills—Union, S. C.
Langley Mills—Langley, S. C.
Grendel Mills—Greenwood, S. C.
Greenwood Mills—Greenwood, S. C.
Belton Mills—Belton, S. C.
Loray Mills—Gastonia, S. C.
Gray Mills—Gastonia, S. C.
Arlington Mills—Gastonia, S. C.
Flint Mills—Gastonia, S. C.
Cannon Mills—Kannapolis, N. C.
P. H. Hanes Mills—Winston-Salem, N. C.
Proximity Mills—Greensboro, N. C.
Durham Mills—Durham, N. C.
Roxboro Mills—Roxboro, N. C.
Tolar-Hart-Holt Mills—Fayetteville, N. C.
Hart Mills—Tarboro, N. C.
Pilot Mills—Raleigh, N. C.

Cardinal Mills—West Point, Miss.
Lauderdale Mills—Meridian, Miss.
Danville Mills—Danvillle, Va.
Schoolfield Mills—Schoolfield, Va.
Bonham Mills—Bonham, Texas.
Sherman Mills—Sherman, Texas.
Corsicana Mills—Corsicana, Texas.
Itasca Mills—Itasca, Texas.
Brazo Valley Mills—West, Texas.
Prendergast Mills—Prendergast, Tenn.
Davis Mills—Chattanooga, Tenn.
Avondale Mills—Birmingham, Ala.
Lanettt Mills—Lanett, Ala.
Anniston Mills—Anniston, Ala.
Montgomery Mills—Montgomery, Ala.
Fulton Bag Mills—Atlanta, Georgia.
Exposition Mills—Atlanta, Georgia.
Calloway Mills—LaGrange, Georgia.
Moultrie Mills—Moultrie, Georgia.
Trion Mills—Trion, Georgia.
LaFayette Mills—LaFayette, Georgia.
Bibb Mills—Macon, Georgia.
International Mills—LaGrange, Georgia.

At the Brazilian Centennial Exhibition at Rio de Janeiro, Brazil, South America, which has just closed, HILL-STANDARD Equipment was awarded the gold medals.

Catalog on request

HILL-STANDARD CO.

Anderson, Our 23rd year Indiana

"Every Knot a Weaver's Knot"

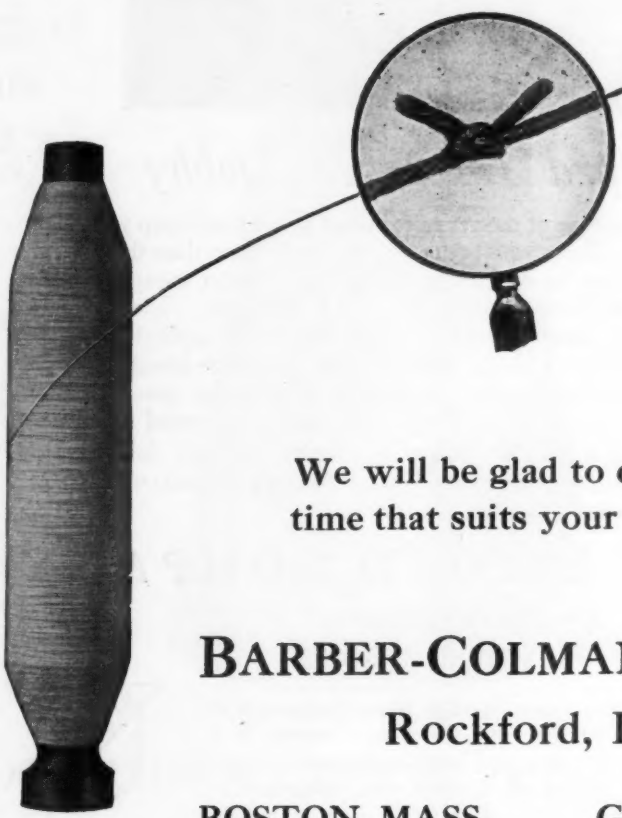
BETTER WARPS

MEAN

BETTER CLOTH

CONSIDER ALSO THAT OUR AUTOMATIC SPOOLERS AND HIGH SPEED WARPERS ARE OPERATED AT HALF THE LABOR COST.

Wouldn't you like to talk it over ?

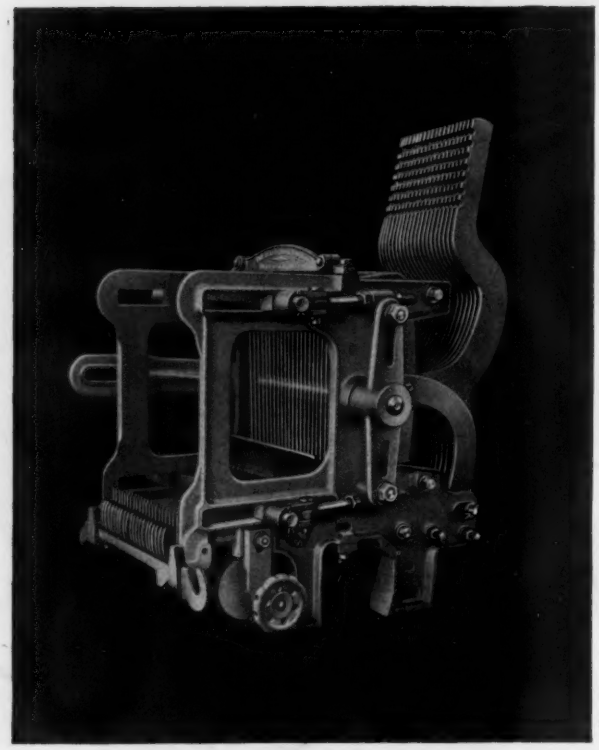


We will be glad to explain at any time that suits your convenience.

BARBER-COLMAN COMPANY

Rockford, Illinois

BOSTON, MASS. GREENVILLE, S. C.



Stafford Improved Dobby

Why not take advantage of the vogue for fancy goods and equip your plain looms with dobbies? There is no better time to install them than the present.

Stafford dobbies have been used exclusively for a great many years by mills, large and small, both in this country and elsewhere. They may be attached to either our own or other makes of looms by application of the necessary fittings. Jumper motions, slackeners, etc., may be attached as desired. From a mechanical standpoint Stafford dobbies are unsurpassed in design, workmanship, accessibility of parts and general all-round excellence.

We have prepared a booklet dealing specifically with our dobby which we would be more than pleased to send you. Address our nearest office or, if more convenient, write us direct.

THE STAFFORD COMPANY

Weaving Machinery

READVILLE, MASS.

STAFFORD

Southern Agent—Fred H. White, Charlotte, N. C.
Branch Office—502 Colt Bldg., Paterson, N. J.

Canadian Representatives—
Whitehead, Emmans, Ltd., Montreal.

STAFFORD

"SONOCO"

Yarnsaver

The Round Polished Nose delivers the last inch of the yarn without a "hitch"

The Sonoco Surface catches the yarn at the very first turn

Parallel Tubes
True-Round,
Uniform, Balanced

Have you tried the Cushion Cone? Prevents Cobwebbing

SEND FOR CHART OF COLORS

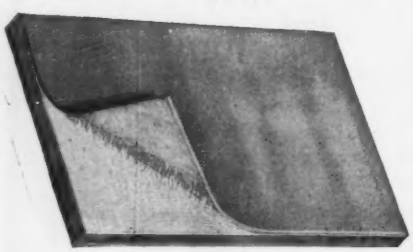
SONOCO PRODUCTS CO., HARTSVILLE, S. C.

CONES, TUBES AND CORES, THAT MAKE PERFECT PACKAGES

Eastern Office: 410 Olympia Bldg., New Bedford, Mass. **Canada: W. J. Westaway Co., Ltd., Hamilton, Ont.**

On the job or the junk pile on June 12, 1934?

How many of the trucks you buy tomorrow will be in service ten years from today?



Haskins "Armord" Trucks for the DYE WORKS

Owing to the patented construction of Haskins Veneered Steel, it is possible to use Monel Metal on exposed surfaces so that an acid-resistant truck is obtained that is very suitable for use in the DYE WORKS—insuring long service and freedom from staining and discoloration problems.

The Monel Metal is reinforced by the wooden core and galvanized back so that the great strength of the Haskins "Armord" Truck is obtained without the excessive cost which would apply to an all-Monel truck of the same strength.

The "death rate" among mill trucks may well be a cause of alarm to many textile men. It's often needlessly high.

"Three or four years" is an average length of life which can be greatly improved upon; a better average can be obtained. It's a case of getting the right truck, that's all.

The many years of service which Haskins Veneered Steel has given, fully justifies the claim that over ten years, without repairs, will be the average life of the new Haskins "Armord" Trucks. Judging from the reception this product has already met with, it satisfies the real need which its makers recognized.

Why Haskins Veneered Steel makes good trucks

Consider first "What is Haskins Veneered Steel?" It's a sheet material with two strips of strong steel including a wood core (to which the strips are firmly attached).

Its many advantages can be readily seen. The steel makes a smooth surface, insuring against any tearing or injuring of choice fabrics. No splintering takes place, and its strength and rigidness enable the steel to ward off blow after blow of the severest kind—violent crashes into posts, machines, other trucks, etc. The smooth surface is maintained for years.

"Armord" trucks are easy to handle

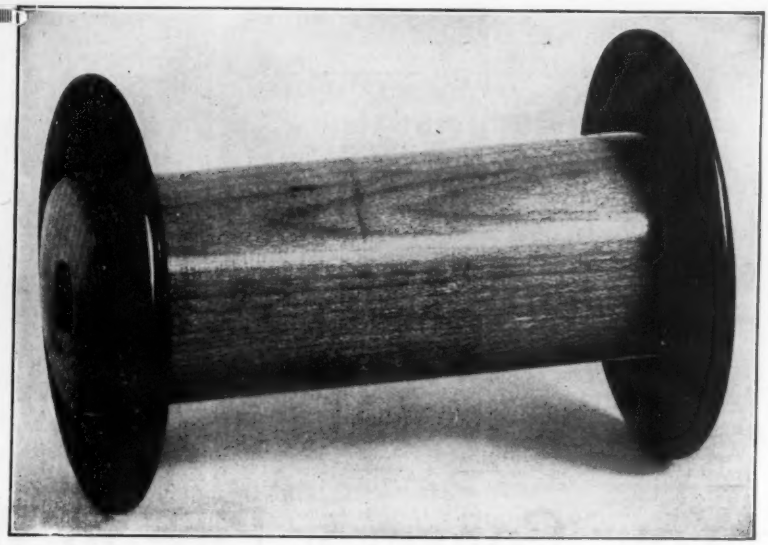
It's certain that all steel trucks would be far too heavy for mill use. That's the reason for the wood core between the sheets of steel. The weight of the trucks is kept down so that easy handling is assured.

If you believe a large percentage of your net purchase of mill trucks should be on the job instead of the junk pile ten years from now, get in touch with us. We'll gladly give further data and prices, which are very reasonable for such long-wearing equipment. We're confident that a trial order of "Armord" trucks will convince you of their serviceability and practicability in textile mill use.

R. G. HASKINS COMPANY
520 W. Monroe St., CHICAGO, ILL.
Trucks that are "slam-bang" proof

HASKINS
"ARMORD" TRUCKS

Spools That Pay for Themselves —Then Pay Dividends



SPOOL breakage and replacement is one of the most important preventable losses in textile mill operation, and it would seem that no modern mill would permit the use of the old style spools that waste so much in yarn and time.

The "DIXIE" Fibre Head Spool is recognized instantly by the practical mill man as a spool that will stand harder knocks and last longer than the majority of the improved spools on the market. It is one of the famous Steel Heddle Products—sufficient to say that it must be better than the best or it could not bear the S. H. name.

The "DIXIE" Spool is the result of a thorough investigation and hundreds of experiences. We know it is a perfect spool, and offer it to our friends with the knowledge that it will mean real savings for them.

Write for a sample—do it today.

STEEL HEDDLE MFG. CO.

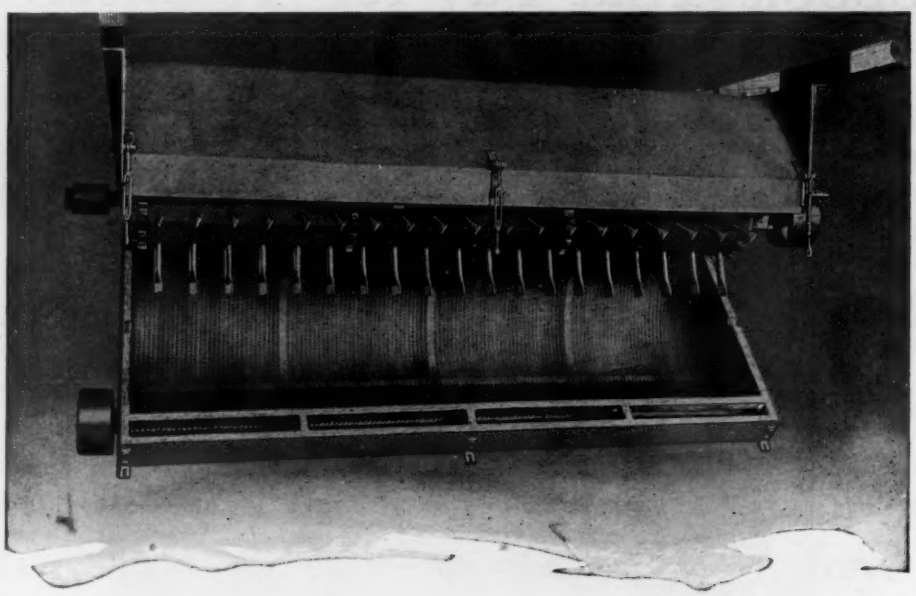
Main Plant:
21st and Allegheny Ave., Philadelphia, Pa.
Southern Plant:
Steel Heddle Bldg., 817-31 E. McBee Ave., Greenville, S. C.
Branches:

Barlow & Hocknell, Huddersfield, England.

Grosvenor Bldg., Providence, R. I.

Robert Lang, Shanghai, China.

"DIXIE" FIBRE HEAD SPOOL



Put Your Conveyor Pipe to Work

You can give your cotton a thorough cleaning, opening and aerating, while it's being conveyed from the bale breakers to the picker room. The Murray Cotton Cleaning and Aerating Machine forms a part of the conveyor pipe, and vastly improves the stock before it is fed to the pickers.

The "Murray" takes up very little extra space since it can be hung from the ceiling. Its supply of cotton is drawn through it by the suction of the conveyor pipe fan, no additional fan or increased draft being necessary. A further economical feature is the fact that the "Murray" requires practically no attention since the dirt is automatically disposed of through a chute at one end.

Handles 2,500 Lbs. Hourly.

2,500 pounds of cotton per hour can be cleaned, opened and aerated in the Murray machine at a power expenditure of only 3 to 5 H.P. The stock is given a thorough treatment by 114 revolving arms.

The Bowling Green Spinning Mills write us stating "The Opener we purchased from you is giving entire satisfaction in every way. In fact we think it is a wonderful machine."

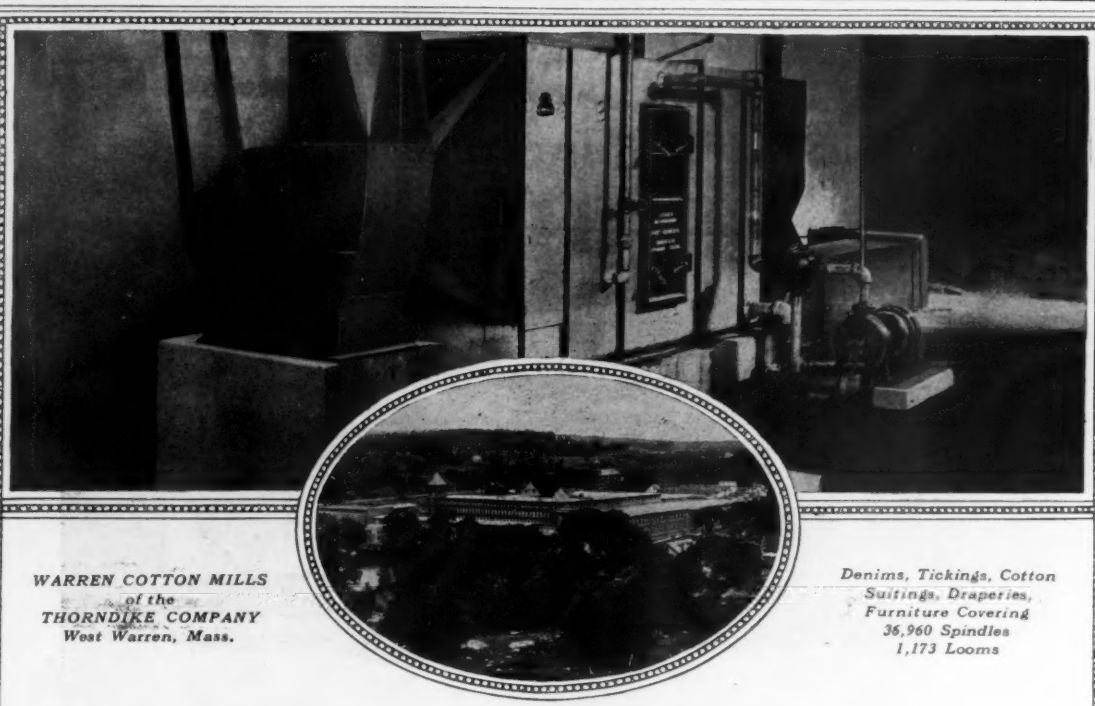
THE MURRAY COMPANY, ATLANTA, GA.

Northern and New England Sales Representatives:
Aldrich Machine Works
P. O. Box 132, Providence, R. I

Carolina Sales Representatives:
Carolina Specialty Co.
Brevard Court
Charlotte, N. C.

The Murray
(PAT. PENDING)
COTTON CLEANING AND AERATING MACHINE

COTTON WELL OPENED IS HALF SPUN



WARREN COTTON MILLS
of the
THORNDIKE COMPANY
West Warren, Mass.

Denims, Tickings, Cotton
Suitings, Draperies,
Furniture Covering
36,960 Spindles
1,173 Looms

ParkSpray Conditioning Room Helps Warren Cotton Mills

Better Product—5% More Loom Production

"Regarding the performance of the conditioning equipment which you furnished us, we are pleased to inform you that this unit has exceeded our expectations in every way.

"Previous to this installation, we had tried in an ineffectual way to accomplish these same results, but only regret that we did not resort to your specially designed apparatus before we did.

"The entire installation is satisfactory from every standpoint, and has equalled and surpassed every specification submitted in your original proposal, even in view of the fact that we are operating the equipment in a room much larger than the one you were requested to quote on."

WARREN COTTON MILLS

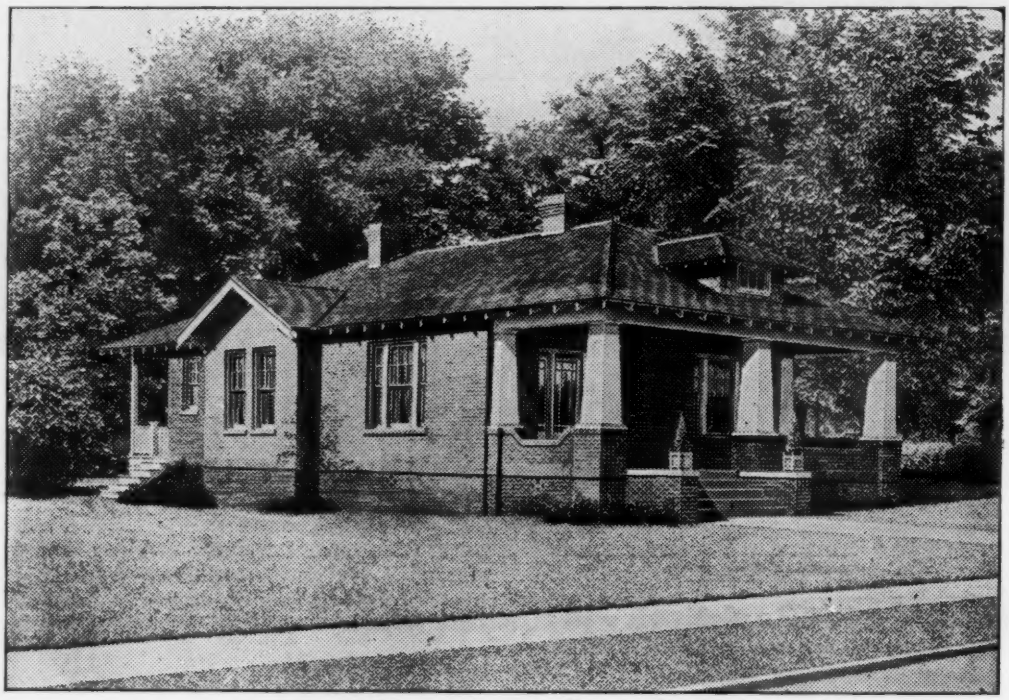
V. L. Faunce Agent.

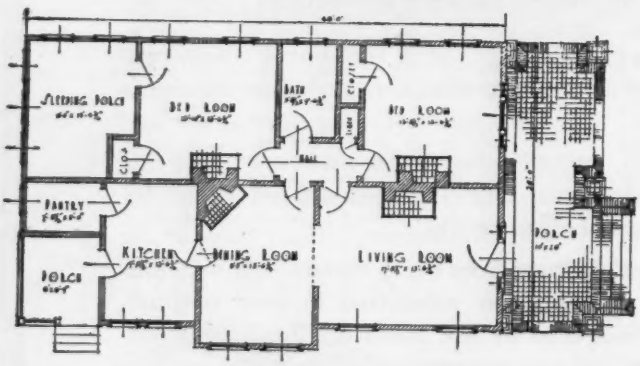
Parks-Cramer Company

Engineers & Contractors
Industrial Piping and Air Conditioning

Fitchburg Boston Charlotte

We Handle Every Building Detail





FLOOR PLAN
of the Minter Home Illustrated Above

Type of Minter Home selected for Superintendent's Residence by a leading Textile Firm. Exterior finish of this attractive home may be either brick veneer, as shown, or in wood.

You are delivered completed homes when you place your housing in our hands. Only one contract is necessary.

No matter what your building needs may be—one and two-story community houses, churches, stores, school houses, moving picture theatres, apartment houses or other structures—you can have them erected in exact accordance with your plans or those of your architect without being troubled by any detail.

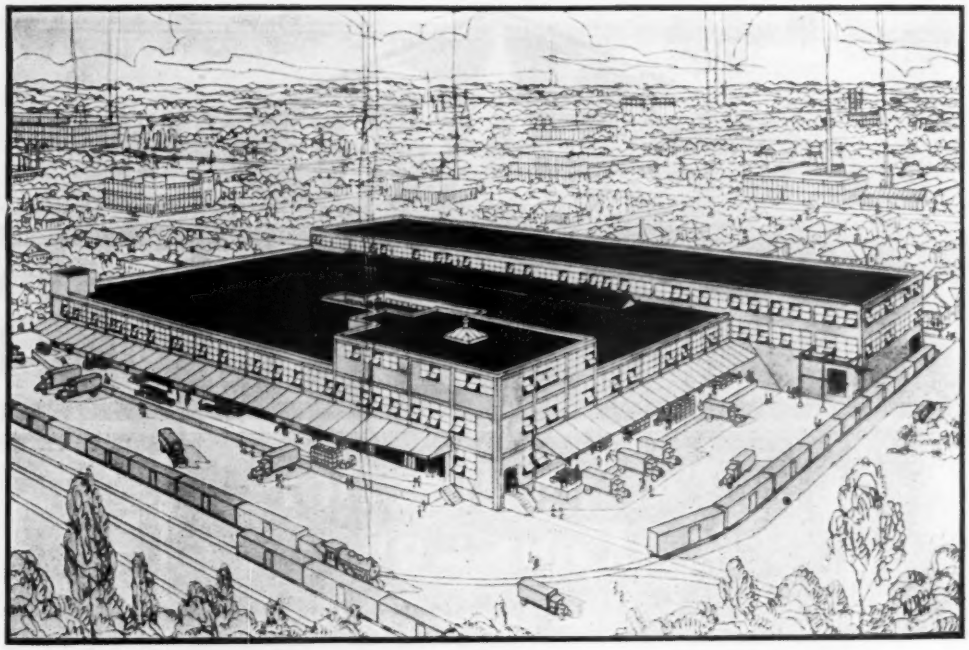
All Minter structures are built of the best materials of the kind specified, are erected in minimum time and without loss of time, labor or materials.

The Minter System is the modern method of building that saves your time, your nerves and the money of you and your stockholders.

Write us today about the houses you need.

THE MINTER HOMES CO.
GREENVILLE, SOUTH CAROLINA

MINTER HOMES CORPORATION
HUNTINGTON, WEST VIRGINIA



An enduring Viskalt roof for this new Chicago plant

In planning their new Fibre Products plant, The Chicago Mill and Lumber Company wanted a roof of proved durability and long-time economy. So upon the facts established by thorough, scientific investigation their engineers and architects recommended a Viskalt Membrane Roof for this building.

How long an applied roofing will last depends, as you know, upon the quality of its felt base and that of the waterproofing used on it.

The inner foundation of Viskalt Membrane Roofs is Richardson felt, which has excelled for more than half a century. Maximum absorptive capacity, great tensile strength, unusual pliancy and certain uniformity—these qualities make of it the ideal long-wearing waterproofing base.

And the waterproofing for this sturdy foundation is Viskalt—a 99.8% pure bitumen, especially vacuum-processed to give a degree of permanence hitherto unknown. Exacting tests show that under every strain of temperature, weathering, tension and pressure this remarkable waterproofing remains pliant, adhesive and impervious to water.

These factors which combine to insure years of care-free endurance, plus moderate cost of application, make a Viskalt Membrane Roof doubly economical and satisfactory. Fifty-five years of manufacturing experience are back of the materials it contains. And remember, there is a Viskalt Compound for every waterproofing need.

Let us send you an interesting pamphlet containing valuable roofing information and complete specifications. Just use the coupon below.

The RICHARDSON COMPANY
Lockland (Cincinnati) Ohio

Chicago New Orleans Atlanta New York City Dallas

THE new Fibre Products plant of The Chicago Mill and Lumber Company is said to be one of the most modernly equipped plants in the world for making Fibre and Corrugated products. It is carefully designed to give plenty of light and air, and to afford the most efficient arrangement of machinery.

In selecting the roof for this new building the Engineers and Architects, Messrs. Francisco and Jacobus, New York, Detroit and Chicago, add their endorsement of the Viskalt Membrane Roof to that of many other notable industrial architects and engineers. Thus Viskalt is becoming recognized more and more as the ideal covering for industrial buildings everywhere.

RICHARDSON
Viskalt Membrane ROOFS

PLIANT UNDER STRESS

The Richardson Company
Construction Materials Division
Dept. 44-O, 1008 Fisk Bldg.,
New York City
Gentlemen: Please send me your pamphlet of specifications for Viskalt Membrane Roofs.

Name.....

Address.....

.....

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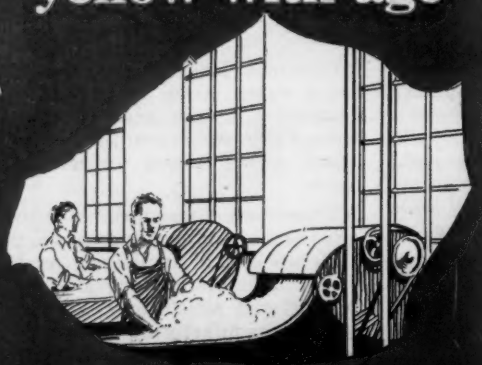
TRADE OJACO MARK

MILL WHITE

For an Interior Finish of Clean, Fresh Whiteness that will NOT yellow with age



OLIVER JOHNSON & CO. Inc.
Makers of Paints
for all Industrial Purposes
18-24 Custom House Street
Providence

DISTRIBUTORS

BOSTON, MASS. Lewis E. Tracy Co.
FALL RIVER, MASS. Wm. F. Harticorn
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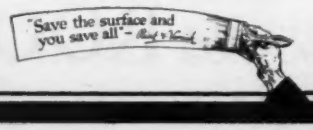
UTICA, N. Y. American Hard Wall Plaster Co.



Machines and the Man

How much can a normal man produce operating a machine in a specified manner?

This question, put to us some years ago, was the germ of the idea out of which grew Cotton Research Co., a subsidiary of Lockwood, Greene & Co. and Pacific Mills. A small group of Lockwood-Greene men, engineers and managers, first undertook to answer the question. Their research led from one problem of textile manufacturing to another until the undertaking grew far beyond the original small group.

The Cotton Research Company was then organized and its scope broadened to include practically every phase of textile manufacturing. Its work includes the scientific study of processes and the development of methods affecting production costs.

Your problem is neither too large nor too small for thorough attention. Lockwood-Greene offer a completely rounded service, from a preliminary study of the manufacturing requirements to the delivery of the finished plant. In the Lockwood-Greene organization, men of broad business and financial experience, architects and engineering experts are at your service.

Consultation with one of our representatives is solicited. We will send on request, "Building with Foresight"—a booklet which shows pictorially some of the work we have done for others.

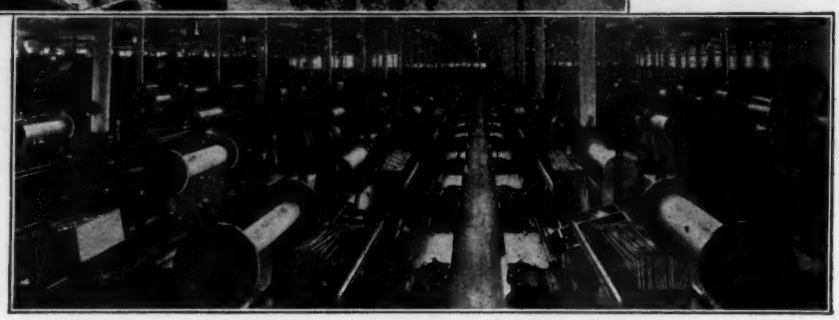
LOCKWOOD, GREENE & CO.
ENGINEERS

EXECUTIVE OFFICE, 24 Federal Street, BOSTON

BOSTON NEW YORK CHICAGO
DETROIT ATLANTA CLEVELAND CHARLOTTE SPARTANBURG

Lockwood, Greene & Co., of Canada, Limited, Montreal
Compagnie Lockwood Greene, Paris, France.

Exterior view of new weave shed of Judson Mills, Greenville, S.C., recently completed under our supervision.



Weave Room of Dunean Mills, Greenville, S. C. The original mill and all additions were designed by us.

DUNEAN and JUDSON~

THESE two textile plants, Dunean Mills and Judson Mills, are so well-known in the industry that it is hardly necessary to say they are both located in Greenville, S. C.

They operate practically one-half of the total number of looms in the South devoted to fine fabrics, and produce more than fifty percent of such goods made in the South.

Such is the beauty of the cloth constructions woven in these two mills that the unfamiliar visitor stands almost bewildered between lanes of artistic patterns of fine dress fabrics, fine shirtings, and fancy handkerchief cloth, flowing smoothly from the looms to the rolls.

They are internationally known as two cotton mills of outstanding superiority in equipment as well as in product.

This organization of Engineers has participated in the development of both properties.

J. E. SIRRINE & COMPANY

Engineers

Greenville South Carolina

SERVICE

It's House Painting Time

In deciding on paint for your houses consider carefully the question of protective value.

Forget—if you will—the appearance of your village. You don't paint houses solely with an eye to beauty. You want attractive looking houses, but you buy paint primarily to protect your investment.

Degraco House Paints make a town attractive—and keep it attractive. But more—they represent protection over a long period of years for little money.

In buying Degraco Paints you get a known value demonstrated by years in service.

DEGRACO PAINTS

DEGRACO PRODUCTS

(246)

- Superior Graphite Paint
- Sta-White
- Degraco House Paint and Varnish
- Degraco-Tone-*Flat wall finish*
- Degraco Brick and Concrete Paint
- Anti-Aqua-*Damp-proof coating*
- Degraco Gas Holder Paint
- Degracolin-*Concrete floor hardener*
- Degraco Enamels
- Industrial Finishes

DEGRACO PAINTS
All Colors for Your Particular Needs

MADE BY
Detroit Graphite Company
517 Twelfth Street
DETROIT U.S.A.

DEGRACO PAINTS ARE SOLD THROUGH BRANCH OFFICES WITH WAREHOUSE STOCKS IN ALL PRINCIPAL CITIES
MANUFACTURED IN CANADA BY DOMINION PAINT WORKS, LIMITED, WALKERVILLE, CANADA

Worth Brothers Woolen Mills
Los Angeles, California

Results Count

MANY textile manufacturers have found that Westinghouse-planned industrial lighting yields most satisfactory dividends.

RLM reflectors equipped with Westinghouse Mazda lamps provide efficient mill lighting.

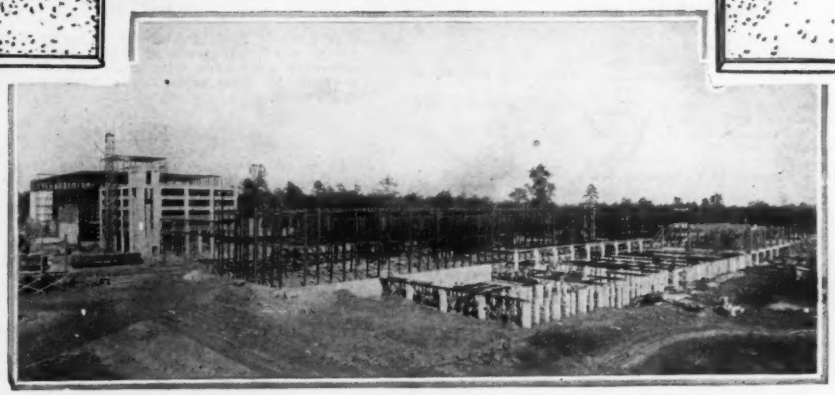
Effective lighting makes for order and cleanliness in the mills, creates more satisfactory working conditions, decreases the number of accidents, gives greater production with the same labor cost and lessens spoilage.

The Westinghouse Illuminating Engineering Bureau will gladly plan an installation that will give your mills the most effective lighting.

Westinghouse Electric & Manufacturing Company
George Cutter Works South Bend, Ind.
Sales Offices in All Principal Cities of
the United States and Foreign Countries

Westinghouse

BETTER CONCRETE



General view of the five million dollar textile plant erected by Pacific Mills at Lyman, S. C.; Parklap, Inc. (New York), contractors; Lockwood-Greene Co. (Boston), engineers. Reinforced Slag Concrete throughout.

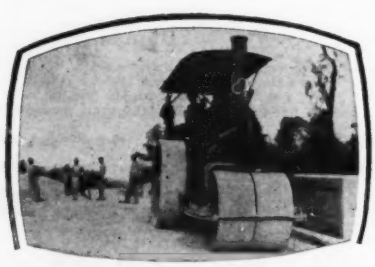
The South broke all construction records in 1923, using over one million tons of

"ENSLEY" & "ALA CITY"

BASIC SLAG

CRUSHED & SCREENED

in concrete buildings and roads



F. A. P. 32 (Nassau County)—10 miles Penetration Slag Macadam between Callahan and Jacksonville. More than 125 miles of this sturdy type of paving have been laid in the Southeast in recent years.

The South believes in fireproof, concrete construction. And Southern architects and engineers—in their search for the most enduring type of concrete—find it in our scientifically prepared Basic Slag.

This is due to the fact that SLAG is angular, tough and porous—an ideal aggregate—the cement penetrates every pore and becomes an inseparable part of the concrete. The bond is perfect, everlasting!

BIRMINGHAM SLAG CO.

ATLANTA · BIRMINGHAM · THOMASVILLE

DESIRABLE EQUIPMENT

OFFERED AT ATTRACTIVE PRICES

Fans and Blowers

1—160″ Buffalo steel plate induced draft fan.
2—120″ Buffalo steel plate induced draft fans.
10—Connersville 26″ x 36″ horizontal top discharge gas blowers. Cap. 24.5 cu. ft. per rev.
1—Roots Style D high pressure type blower. Capacity 890 cu. ft. per min. at 435 r.p.m.
3—Roots No. 3 Pressure blowers, double outboard bearing and outboard pulley bearing.
8—24″ Buffalo Electric Disc. exhaust fans.
8—30″ Buffalo Electric Disc. exhaust fans.

Accumulators and Compressors

2—42 x 11½ x 50 Hydro pneumatic accumulators. Designed for 300 lbs. air service. Equipped with Watson-Stillman Automatic Regulator.
2—15 and 26 x 20 x 24 Compound duplex Laidlaw compressors. Pressure 80 lbs. Capacity 2,570 cu. ft. at 150 r.p.m.
2—9½ x 5 x 10 right and left hand, air jacketed, steam driven compressors. Operate at 150 lbs. pressure. Receive air at 120 lbs. pressure and deliver at 300 lbs. pressure.

Boilers

17—823 h.p. Babcock & Wilcox Stirling water tube boilers, Class M-30, 200 lbs. pressure. Complete with Westinghouse stokers, forced draft fans, Vulcan soot blowers and all accessories.
2—300 h.p. Heine boilers, 150 lbs. pressure. Murphy stokers and accessories.

Structural Steel Buildings

2—Structural steel buildings, 85 ft. 6 in. wide, 184 ft. long, 75 ft. 6 in. high. Covered with corrugated iron. Buildings of heavy construction, and designed for heavy loading of floors.

Crane

1—110′ Fixed radius Link-Belt industrial crane. 5½ yd. bucket, 250 t.p.h. capacity.

Cotton Purification Machinery

35—Welded steel digesters, made by Continental Iron Works, capacity 1,300 cu. ft. Inside diameter 8′0″, length overall 27′0″. Shell 15/16″, tank steel at bottom, tapered to 25/32″ at top. Working pressure 110 lbs. per sq. in.
20—Six section, No. 24, 8-ft. cotton dryers. Equipped with Model ″M″ self-feeders. 12,556 sq. ft. heating surface to dryer. Automatic sprinkler system throughout.
20—Mixing pickers, manufactured by Sargent's Sons Corporation. Cylindrical type, 48″ size, 10 right hand, 10 left hand. Feed apron heavy leather belt with maple slats. Equipped with single pair fluted feed rolls 3½″ diameter. Main cylinder heavy cast iron spiders mounted on 2 7/16″ shaft. Capacity 600 to 800 lbs. per hour.
20—Model ″M″ feeders for Sargent dryers.
8—Concentrators, manufactured by Noble & Wood Co. Right and left hand cylinder washers with octagon cylinder, diameter 44″, length 42″. Cylinder heads Gulf cypress. Buckets 1″ native pine. Cast iron outlet with wide discharge openings. Rotates at 6 r.p.m. Vat is 4′1 3/4″ wide, 6′9″ long, 2′9″ high.

Elevator

1—Otis Electric Freight Elevator, capacity 6,000 lbs. Platform 10′ x 10′2″. Distance of travel 36′2″. Engine, Otis high efficiency gear type with drum and Otis No. 10, 440 volt, 3 phase, 60 cycle motor. Car frame built of steel channels and angles.

Engines

7—18″ x 36″ 350 h.p. Allis-Chalmers heavy duty mill type Corliss engines. Equipped with Richardson-Phenix oil filtration and lubrication systems.

Motors

125—Used motors, ¼ to 150 h.p. Write for list.

Transformers

45—Used Transformers, 10 to 600 KVA. Write for list.

Steel Tanks

25—6′ x 24′—3/16″ plates, horizontal, 5,120 gal.
15—7′ x 36′—1/4″ plates, horizontal, 10,365 gal.
40—8′ x 6′—3/8″ plates, vertical (bolted type), 2,256 gal.
25—20′ x 12′—1/4″-7/16″ plates, vertical (storage), 28,200 gal.
Write for Bulletin No. 7 listing over 500 tanks in sizes from 119 gal. to 55,000 gal.

Scales

Capacity	Description
10 Ton	Howe Miner Scale, 8′ x 6′, single beam, baem box.
10 Ton	Howe wagon and truck scale, 7′ x 14′, with beam box and single beam of 2½ lb. graduation.
10 Ton	Howe wagon and truck scale, 7′ x 16′, with beam box and single beam of 2½ lb. graduation.
15 Ton	Howe miner scale, 8′ x 10′, single beam and beam box.
15 Ton	Howe truck scale, 18′ x 8′, single beam.
15 Ton	Howe truck scale, 20′ x 8′, single beam.
15 Ton	Howe truck scale, 22′ x 8′, single beam.
40 Ton	Howe tank scale, 10′ x 18′, with beam box.
60 Ton	Howe tank or truck scale, 8′ x 18′, beam box and single railroad beam.
100 Ton	Howe tank scale, 8′ x 24′, fabric I-beams, beam box and single railroad beam.
100 Ton	Howe track scale, 8′ x 48′, beam box, single railroad beam and full steel construction.

Write for Bulletin No. 20.

Time Clocks

4—Time clocks for punching time cards. Made by Stromberg Electric Co.

Pumps

25—4″ Baker centrifugal pumps.
16—6″ Baker centrifugal pumps.
15—6 x 2½ x 6 Worthington duplex pumps.
8—25 and 38 x 4⅝ x 24 Worthington tandem compound duplex pumps.
3—8″ 3-stage Alberger-Curtis steam turbine driven boiler feed pumps.
6—14″ Worthington Class B centrifugal pumps, with 300 h.p. motor.
3—14″ Allis-Chalmers Type S centrifugal with 300 h.p. turbine.
6—16″ Allis-Chalmers Type S centrifugal with 300 h.p. turbine.
Write for list of pumps.

Prices and specifications furnished on request.

NASHVILLE INDUSTRIAL CORPORATION

OLD HICKORY, TENNESSEE

BOWSER
ESTABLISHED 1885

THE BIGGEST THING Bowser has to offer today is *knowledge*—the actual experience in storing and distributing oils, under all conditions, in every sort of mill.

Moreover, Bowser's own skill is being constantly enlarged by contact with the keenest engineering brains in mills and power plants everywhere.

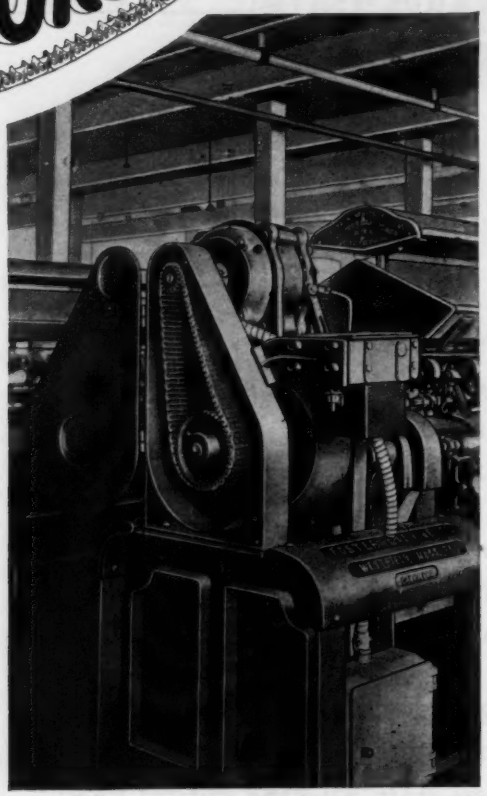
In designing, building and installing oil storage, distributing and filtration systems, Bowser thus offers the abilities of its own large staff, plus the critical knowledge of thousands of textile engineers.

It is such experience that makes it possible to say first, that your oil problem *can* be solved by Bowser; and second, that Bowser *will* guarantee results.

S.F. BOWSER & COMPANY, Inc.
Dependable Pumps and Tanks
FORT WAYNE, INDIANA, U.S.A.
Sales and Service Representatives All Over The World

"Oils cost money; handle them the *Bowser* way."

MORSE SILENT CHAIN DRIVES



Morse Silent Chain driving from motor to Foster Cone Winder.

For high efficiency and a clean spinning room

The compact, clean, cool and quiet Morse Silent Chain Drive, transmitting 98.6% of the motor power, is rapidly multiplying in textile mills everywhere.

With Morse Chain Drives there is no fly accumulating around the pulleys; there is no constant air currents from floor to ceiling to carry fly to top of room and let it fall back on the roving to get into the yarn. The room and product are kept clean.

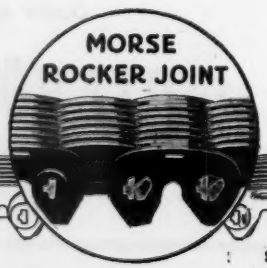
Morse Chains permit closer centers; are long lived; require little attention — beyond occasional lubrication; will not slip; stretch, or sway; these features should recommend the use of Morse Drives for use in your mill.

A Morse Engineer who knows your power transmission needs, is situated near you and will give every assistance to plan a drive that will do the job well.

MORSE CHAIN CO., ITHACA, N. Y.

There is a Morse Engineer near you

ATLANTA, GA...702 Candler Bldg., Earl F. Scott & Co
BALTIMORE, MD.....1402 Lexington Bldg.
BOSTON, MASS.....141 Milk St.
CHARLOTTE, N. C.....404 Commercial Bank Bldg.
CHICAGO, ILL.....Room 803, 112 West Adams St.
CLEVELAND, OHIO.....421 Engineers Bldg.
DENVER, COLO.....1761 Wazee Street, R. M. Parsons
DETROIT, MICH.....7601 Central Avenue
NEW YORK CITY.....Room 1871, 50 Church St.
MINNEAPOLIS, MINN. 413 Third Street, S., Strong-Scott Mfg. Co.
MONTREAL, CAN. St. Nicholas Bldg., Jones & Glassco, Reg'd
PHILADELPHIA, PA.....612 Franklin Trust Bldg.
PITTSBURGH, PA.....Westinghouse Bldg.
SAN FRANCISCO, CAL.....Monadnock Bldg.
ST. LOUIS....Railway Exchange Bldg., Morse Chain Co.
TORONTO, ONT., CAN. Bank of Hamilton Bldg., Jones & Glassco, Reg'd
WINNIPEG, MAN., CAN. Dufferin St., Strong-Scott Mfg. Co.



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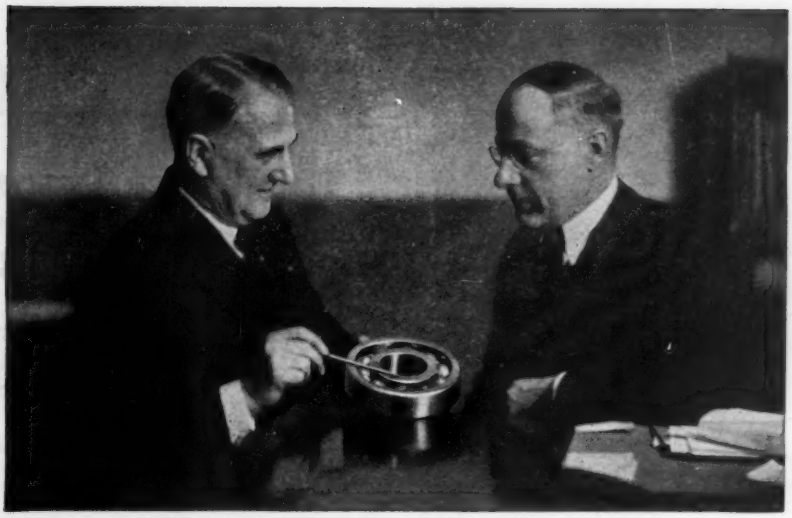


Double-acting thrust bearing, flat seats (grooved races) 2100-F Series

Single-acting thrust bearing, flat seats (grooved races) 1100-F Series

Single-acting, self-aligning thrust bearing 1100 Series

Single-acting, self-aligning thrust bearing, leveling washer. 1100-U Series

Double-acting, self-aligning thrust bearing, leveling washers 2100-U Series

Strom Ball Bearings
on apron rollers
save losses and increase production

The apron rollers of intermediate and finisher pickers cause a heavy drag on the evener mechanism when mounted on plain bearings.

Substitute Strom Ball Bearings and you minimize the drag when several laps run on the apron. So you stop sluggish and unreliable action on the evener and save wear and tear on the aprons.

A Strom Ball Bearing on the end of each roller will pay its way quickly and insure a more uniform lap.

The lessened wear in your picker room will show such marked economies that you'll wonder why you didn't equip with Strom Ball Bearings sooner.

There are many places where Strom Ball Bearings will reduce your operating costs, speed up production, and insure better products.

Let us give you definite information. Our engineers can help you. There are Strom Ball Bearings for all your needs. They are made in a wide range of sizes and styles.

Strom BALL BEARINGS

Manufactured by

STROM BALL BEARING MFG. CO.
Formerly U. S. Ball Bearing Mfg. Co.
4544 Palmer Street, Chicago, Ill.

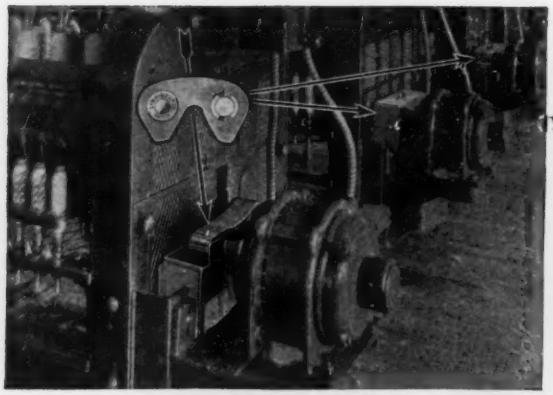
Single-row deep-groove Standard type, radial bearing

Double-row, deep-groove Standard type, radial bearing

Angular contact bearing, combination radial and thrust

Double-row, maximum type, radial bearing

Single-row, maximum type, radial bearing



The Power Transmission
which insures
Steady-Running Frames

Individual Motor Drives with
Link-Belt Silent Chain

EXCESSIVE vibration, in a spinning frame, reduces both quantity and quality, due to breaks in roving.

Flapping belts transmit jerks—gears transmit shocks, and some chain drives are but little improvement.

A way has been found, however, to drive frames more steadily and with less loss of power. This is by individual motors and Link-Belt Silent Chain drives. Southern textile engineers have compiled figures showing the increasing use of Silent Chain Drives in the South. In 1918 there were 1774 in the South. In 1923 there were 14,726, or more than eight-fold increase in the last four years.

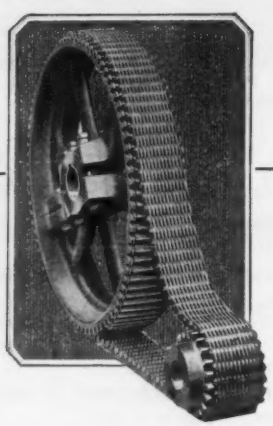
This tendency is constantly increasing, North and South.

Install Link-Belt Silent Chain drives with individual motors. Smooth, steady, vibrationless operation, results.

Uniformity of product is a feature of the even-running Link-Belt Silent Chain driven machines. And not only on spinning frames, but on all the machines listed in the opposite panel. Write for Data Book No. 125.

TEXTILE MACHINES SUCCESSFULLY DRIVEN WITH INDIVIDUAL MOTORS AND LINK-BELT SILENT CHAIN

Cards	Mules
Drawing Frames	Spoolers
Roving Frames	Winders
Slubbers	Looms
Intermediates	Mercerizing Machines
Sliver Lappers	Dyeing Machines
Ribbon Lappers	Printing Machines
Combers	Tenter Frames
Ring Spinning Frames	Calenders
Twisters	Line Shafts



LINK-BELT COMPANY

PHILADELPHIA, 2045 Hunting Park Ave. CHICAGO, 300 W. Pershing Road INDIANAPOLIS, P. O. Box 85

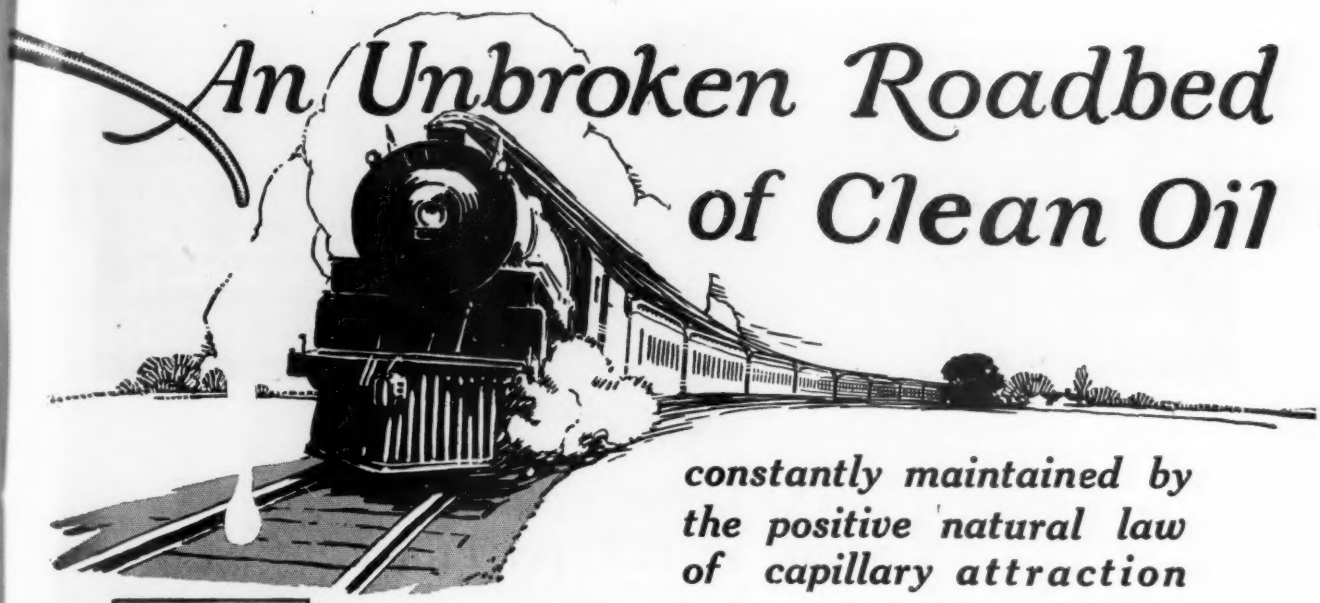
New York - - - - 2676 Woolworth Bldg.
Boston - - - - - - - - 49 Federal St.
Pittsburgh - - - - - - - - 335 Fifth Ave.
St. Louis - - - - - - - - 705 Olive St.
Buffalo - - - - 745 Ellicott Square
Wilkes-Barre 826 Second Nat'l Bank Bldg.
Huntington, W. Va. Robson-Prichard Bldg.
Cleveland - - - - - - 329 Rockefeller Bldg.
Detroit - - - - - - 4222 Woodward Ave.
Kansas City, Mo. R. 405, 1002 Baltimore Ave.
Denver - - - - - - - - 520 Boston Bldg.
Atlanta - - - - - - - - 24 Marietta St.
Louisville, Ky. - - - - 321 Starks Bldg.
Birmingham, Ala 720 Brown-Marx Bldg.
New Orleans - 504 Carondelet Bldg.
New Orleans - - - - - - - -
Whitney Supply Co., Ltd., 418 S. Peters St.
Charlotte, N. C., - - - - - -
J. S. Cothran, 909 Com'l Bank Bldg.
Link-Belt Limited Toronto and Montreal

H. W. CALDWELL & SON CO.:—Chicago, 1700 So. Western Ave.; New York, 2676 Woolworth Bldg.; Dallas, Texas, 810 Main St.

LINK-BELT MEESE & GOTTFRIED CO.:—San Francisco, 19th and Harrison Sts.; Los Angeles, 400 E. Third St.; Seattle, 820 First Ave. S.; Portland, Ore., 67 Front St.

LINK-BELT
SILENT CHAIN DRIVES

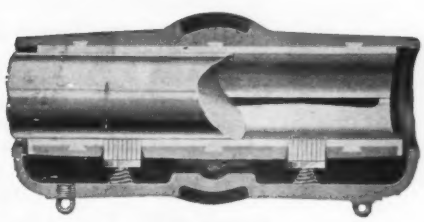
An Unbroken Roadbed of Clean Oil



constantly maintained by the positive natural law of capillary attraction

Fig. 1. Photograph illustrating capillary attraction between two glass plates standing parrallel in oil. As shown, the oil has risen between the plates to a height above the surface of the oil in the tray proportionate to the distance between the plates.

Fig. 2. Same plates as shown in Fig. 1, made to touch at their right hand ends only. Oil has risen to the tops of plates at points of contact. These plates are in the same relative position as the surface of a Dodge Capillary Bearing.



Oil from the reservoir of the Dodge Capillary Bearing rises to the shaft through the alternate saw cuts in the wooden blocks by capillary attraction.

A continuous, uniform and unbroken film of oil is constantly maintained between shaft and bearing liner preventing bare contact of metals which means friction and loss of power.

The Capillary Oiler is automatic in operation and requires practically no attention aside from draining and refilling every six months. It is non-agitating and only clean oil is supplied to the shaft.

Depreciation is negligible — these bearings will be as efficient and serviceable after twenty years or more as when originally installed.

Buy Dodge Capillary Oiling Hangers and Pillow Blocks from your local dealer on the immediate delivery basis.

Fig. 3. To represent the shaft in a capillary bearing, a strip of glass has been laid on top of the two plates. Note the increased raise of oil in its endeavor to cover the top plate. It has the same tendency to cling to the shaft in a bearing.

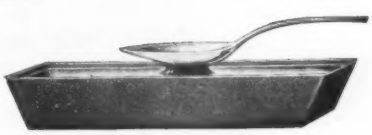


Fig. 4. A spoon supported one-eighth of an inch above the surface of the oil was depressed to touch the oil and was then allowed to spring back to its original position—the oil followed as shown. This same action takes place when the level of the oil gets below the bottom of a Dodge Capillary Bearing.

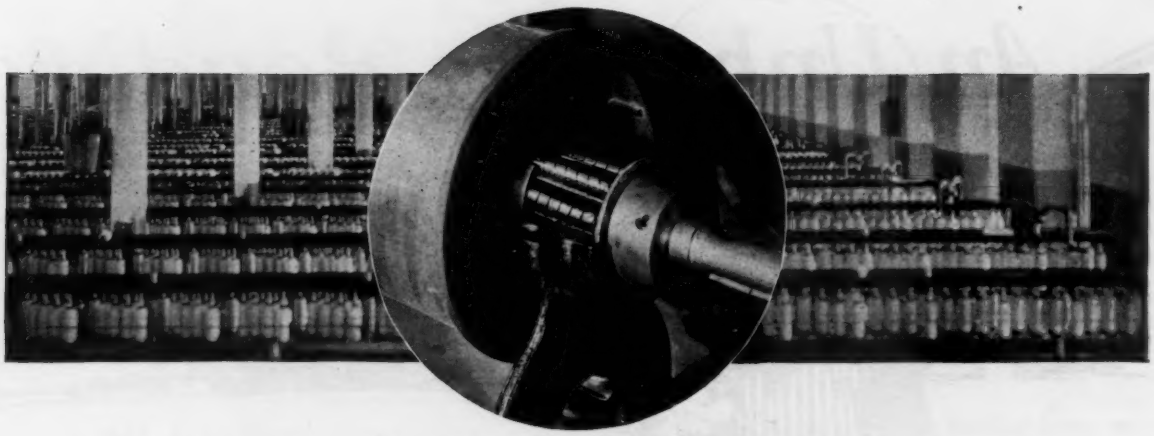
DODGE MANUFACTURING CORPORATION

General Offices: MISHAWAKA, INDIANA
Works: MISHAWAKA, INDIANA, and ONEIDA, N. Y.

EVERYTHING FOR THE MECHANICAL TRANSMISSION OF

Branches: New York Philadelphia Pittsburgh Boston Cincinnati Newark Chicago Atlanta Minneapolis St. Louis Houston Seattle San Francisco

Power



The Dollar Value Of Saving ½ H.P. per Frame

A Southern Mill (20,000 spindles) spends $9,825.00 each year on power for spinning alone as follows:

No. of 252 Spindle Frames		Average H.P. each (tape drive)		Total H.P.		Average Cost per H.P. year		Annual Power Bill
80	x	4.91	=	393	@	$25.00	=	$9,825.00

Based on repeated mill tests, a saving of $1,020.00 would result with Hyatt bearings on cylinder shaft only, thus:

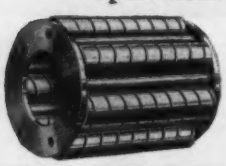
No. of Frames		Average Saving H.P.—per Frame		Total H.P. Saved		Average Cost per H.P. year		Annual Power Saving
80	x	.51	=	40.8	@	$25.00	=	$1,020.00

If Hyatt bearings had originally been specified on the cylinder shafts at $35.00 extra per frame, the total additional cost would have been $2800.00.

$$\text{Investment Value} = \frac{\text{Annual Saving}}{\text{Total Cost}} = \frac{\$1020}{\$2800} = 36\%$$

In the East power costs are higher, making this return proportionately larger. And throughout the country the trend is decidedly upward.

By specifying Hyatt roller bearings you can secure this power saving, together with the additional advantages of lower maintenance costs and dependable operation.



HYATT ROLLER BEARING COMPANY

NEWARK DETROIT CHICAGO SAN FRANCISCO
HUNTINGTON PHILADELPHIA PITTSBURGH MINNEAPOLIS
WORCESTER BUFFALO CLEVELAND MILWAUKEE

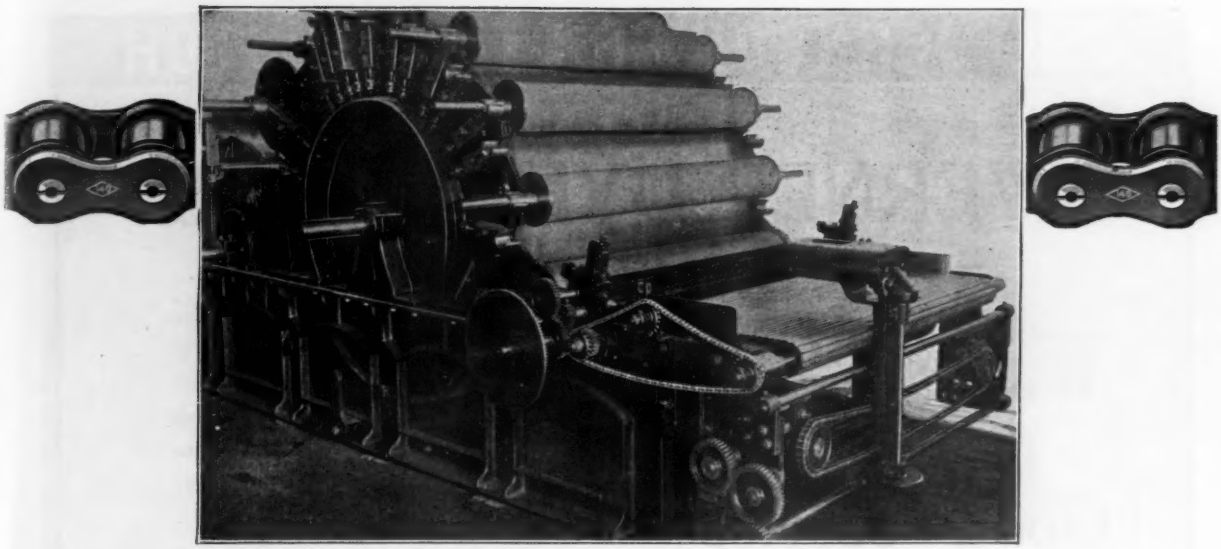


Illustration above shows Diamond Roller Chain used for auxiliary drive on Scotch Feed of Full Roller Cards, built by the Whitin Machine Works, Whitinsville, Mass.

Used on "Whitin" Full Roller Cards

SIMPLICITY and convenience were the deciding factors in the selection of DIAMOND Roller Chains for use on this machine.

"The reason for applying chain drive to this particular attachment is that it makes a much more simple drive than with shafts and gears."

Roller chains also provide the most convenient type of drive for the installation because of their flexibility as to shaft center distances; and interference with other parts is avoided by using an idler.

Incidentally, the initial cost of roller chains is lower than that of any other satisfactory drive, and they require no maintenance during the life of the machine. Look over the power transmission equipment in the mills you operate, or on the machines you build, and see if there are not several places where this simple, convenient type of drive might solve a troublesome problem. Then ask our engineers for their recommendation. The use of this service places you under no obligation.

The DIAMOND Trade Mark

Look for this mark of quality on chains and sprockets. It is backed by 34 years of wide experience.

Catalog and Data Sheets

Every mill executive should have these on file. You'll find them of real help. Write us for copies.

DIAMOND CHAIN & MFG. CO. Indianapolis, U.S.A.

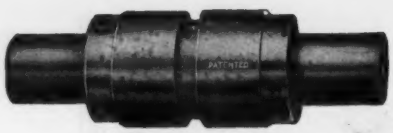
Makers of High Grade TRADE MARK *Chains Since 1890*

DIAMOND Roller Chains

THE JOHNSON FRICTION CLUTCH

as used on the

WERNER DYE JIGGERS



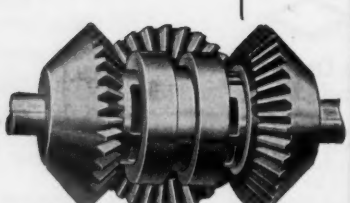
Double Clutch Exterior

Good Service and Long Life

On this battery of three Dye Jiggers of Werner & Co., Inc., of Passaic, N. J., three No. 4 Double Johnson Clutches are used. One clutch is on the end of each machine to operate the rolls either way through bevel gears mounted on hubs.

Leading textile manufacturers all over the country have adopted the Johnson on its merits.

COURTESY: Werner & Co., Inc., Passaic, N. J.



Double Clutch in Nest of Bevel Gears.

Johnson Clutches are backed by a capable and experienced engineering department. No problem too intricate. The Johnson is a reliable, powerful, dependable clutch, and is giving splendid service on thousands of machines throughout the United States.

WRITE US TODAY FOR CATALOG "G"

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

They Needed More Power

THE Anchor Post Iron Works at Garwood, N. J. was confronted with the problem of either installing a larger engine or an additional motor, purchasing power outside.

An advertisement of Hyatt roller bearings attracted their attention and they investigated. As a result they removed their power-wasting babbitted boxes replacing them with Hyatt bearing boxes.

The new engine or additional motor was made unnecessary and sufficient power was saved to operate additional shafting and machines.

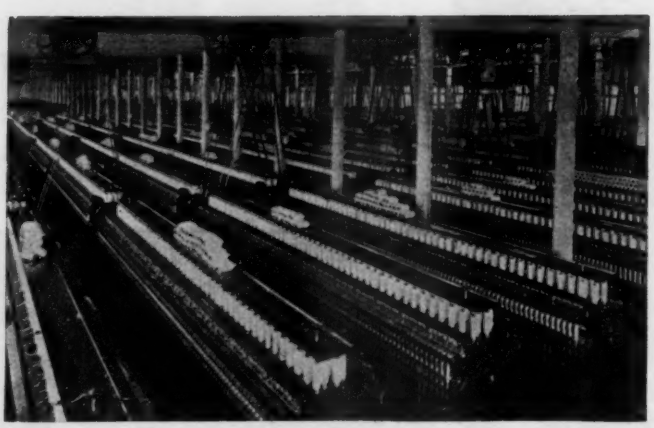
Hyatt line shaft bearings are fundamentally correct in principle and design. They will save at least 15% of power and 80% of lubricating cost. Being split, they can be installed without disturbing shafting, pulleys or belts.

Engineering Bulletin 130 describes these bearings fully, listing sizes, dimensions and prices. Write for a copy.

'Phone the Nearest Mill Supply Dealer

HYATT ROLLER BEARING COMPANY
NEWARK, NEW JERSEY
PACIFIC COAST ADDRESS: SAN FRANCISCO, CAL.

The Proximity Manufacturing Company



The illustration to the right is the spinning room of the PROXIMITY Cotton Mills. The large picture shows a bird's eye view of the WHITE OAK MILLS. In addition to being the largest Denim making plant in the world the Proximity Manufacturing Company operates its own school system where 2,000 pupils are looked after. There are also two Y. M. C. A.'s with swimming pools, physical and social activities.

BUTTERWORTH

Where Every Day Enough Denim for 100,000 Pairs of Overalls Is Made—and Finished on *Butterworth Machinery*

In 1895 the Proximity Manufacturing Company near Greensboro, N. C., was a place of 7,000 spindles and 240 looms. Today the Proximity Manufacturing Co. with 20 warehouses, capable of holding 30,000 bales of cotton, covers 20 acres and has 35 acres of floor space. In their two cotton mills—the White Oak and Proximity—there are 113,000 spindles and 4,600 looms and their Print Works, all capable of turning out enough denim every day to make 100,000 pairs of overalls.

> This company is the largest manufacturers of denim and work clothes fabrics in the world.

The product of this company's plants is known the world over as CONE'S Denims. The Proximity Print Works produces Piece dyed Khaki, Piece dyed Discharge Printed Indigo Drills and Art Tickings, all dyed and finished on Butterworth Machinery.

The Butterworth Organization is indeed proud that Butterworth Machinery is used in finishing all these products; for the Proximity Manufacturing Company is today one of the South's big institutions. It has grown so because of management and product. Management selected Butterworth Machinery and the finish which these machines have produced, we feel sure, has helped these mills to sell Proximity products the world over.

H. W. BUTTERWORTH & SONS CO.

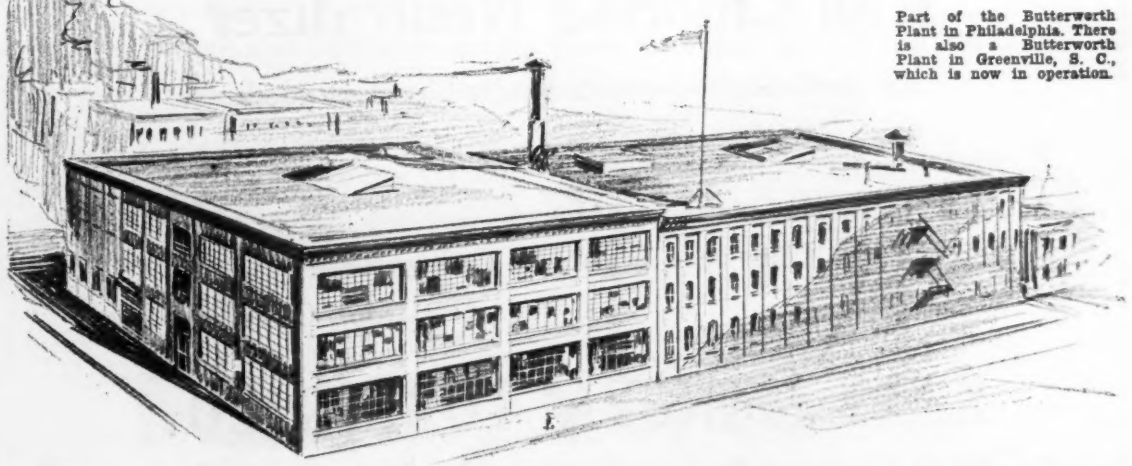
Established 1820

PHILADELPHIA, PA.

Canadian Representative: W. J. Westaway Company Hamilton, Ontario, Canada

Providence Office: Turk's Head Building

Greenville Office: Woodside Building



Part of the Butterworth Plant in Philadelphia. There is also a Butterworth Plant in Greenville, S. C., which is now in operation.

Finishing MACHINERY

Hydroxy Art Silk Coning Oil

A Specially Prepared Oil

Used in the Coning, Winding, and Knitting of Artificial Silk

Makes Artificial Silk Knit Smoothly.
Eliminates Breakdowns. Reduces Seconds.
Washes out easily at low temperature.

Therefore—
Dyeing and Bleaching is even and shades brighter.

Sample sent on request—no charge.

Developene (There Is no "Just as Good")

Makes a rusty Black stocking turn deep Black.

Kali Chlorine Neutralizer

An Anti-chlor—prevents tender bleached goods.

All chemicals for the Dye House—
All oils—Sulphonated—Turkey Red—
Neatsfoot, Olive, etc.

KALI MANUFACTURING CO.

1410 No. Front St., Philadelphia, Pa.
Sole Manufacturers of "Hydroxy Oils" Patented.

Fletcher Underdriven Extractors

Fletcher Electric Underdriven Hydro Extractors combine unusual safety, economy, durability, cleanliness, simplicity, accessibility and ease of control.

Wherever installed these Extractors have done more and better work at a lower cost than any others previously used.

Tell us your extractor requirements and we will prove to you the economy and greater efficiency of Fletcher Extractors in actual service.

FLETCHER WORKS

INCORPORATED

Formerly SCHAUM & UHLINGER

Glenwood Avenue at Second Street : : : : : Philadelphia, U. S. A.

BOSTON, MASS. SAN FRANCISCO, CAL. PORTLAND, ORE.
CHICAGO, ILL. LOS ANGELES, CAL. CHARLOTTE, N. C.

Starch

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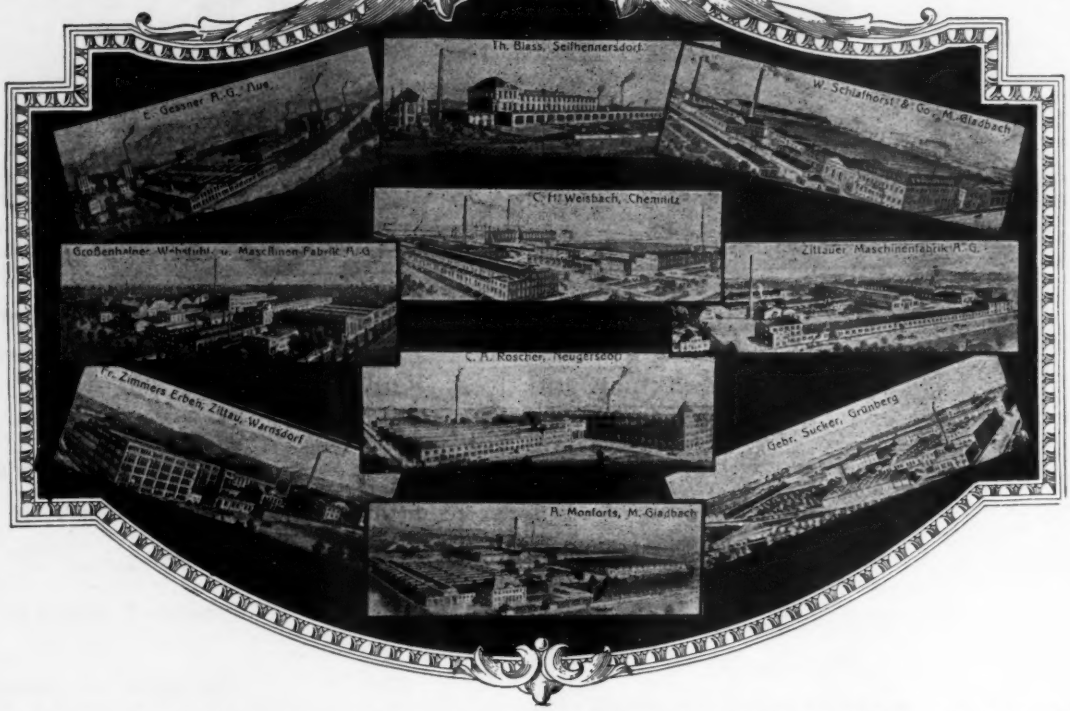

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NATIONAL DYES

COTTON

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When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

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A Southern Institution

TWO great factors in the rapid growth of the Textile Industry in the South have been favorable labor conditions and nearby sources of raw materials.

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With the Publishers—

"When a Feller Needs a Friend"

A salesman for mill equipment calling upon a superintendent not long ago found him looking at a comic picture in one of the daily papers. After a conversation in which the superintendent lamented over one of his weaker departments, the salesman picked up from the desk an unopened copy of a trade paper and recalling the title of the cartoon in the newspaper, said significantly:

"When a Feller Needs a Friend."

Then the salesman went on to show him how that very issue of the trade paper he held in his hand contained an article which offered the solution of the mill man's problem. It was not a new problem but one common to certain branches of the industry. However, a man, not a day's ride away had solved it, and told of his solution through the columns of the paper in question.

More than that the salesman showed this mill man how the key to the puzzle was also contained in an advertisement of his, the salesman's, own firm in that very issue. This advertisement described the installation of certain equipment in another plant and published a letter from the superintendent showing that production had not only been increased but stabilized, and the difficulty complained of eliminated.

This salesman was a keen observer of human nature. He recognized the appeal in that series of cartoons which has made many a beholder sympathetic for the young characters portrayed.

COTTON is generally designed to be a friend to the "feller" who needs it. Material is selected to help puzzled mill men out of their problems. When these problems are solved life will be brighter for them just as it would be for the boy in the cartoon if the needed friend arrived on the scene.

There are several methods used to accomplish the desired end. The editors use their ingenuity to discover the type of leading articles most desired. Mill men often write in and discuss some of their troubles and how they found a solution or a partial solution of the difficulty. Then, if the particular trouble of some individual has been overlooked, or left untouched for some other reason, all that individual has to do is to write the editors and tell them about it. They will start a discussion that will get hundreds of practical experts thinking about the problem and if some of them have not already solved it, a solution will soon be found.

But not all the friendly assistance comes from the editors of and contributors to COTTON. The advertising pages are helpful. Every bit of equipment and supplies advertised therein could tell stories, if they were alive, of how they had come to the rescue of mill men who needed a friend.

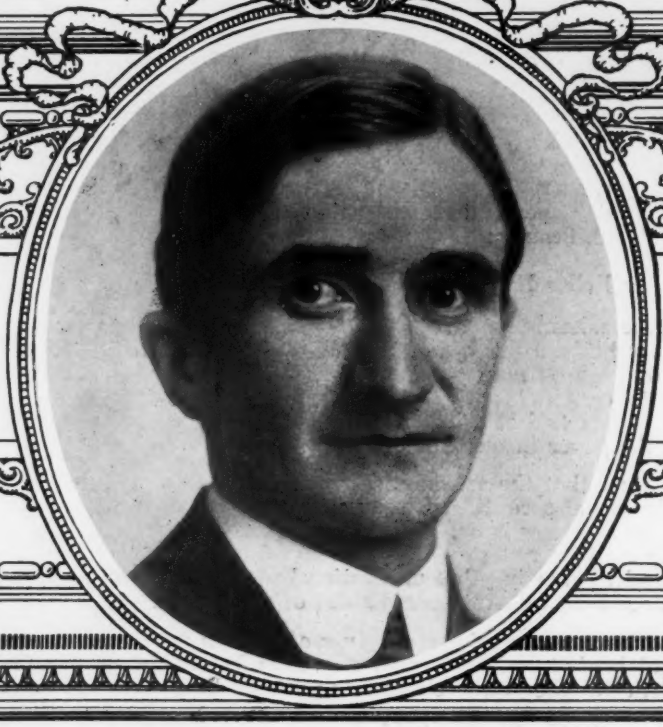
COTTON was not established solely with the idea of becoming a Pollyanna going about trying to make people glad. It is a practical business paper and aims to point the way to the profitable operation of textile establishments, but at the same time there is a reasonable amount of satisfaction in being able to step upon the scene—

"When a Feller Needs a Friend."

That is why a New Hampshire mill man wrote us last month, "In me you have a subscriber for life."

It is also the reason why the manager of a North Carolina hosiery mill wrote us in May, "Just as long as I run a hosiery mill I shall subscribe for COTTON."

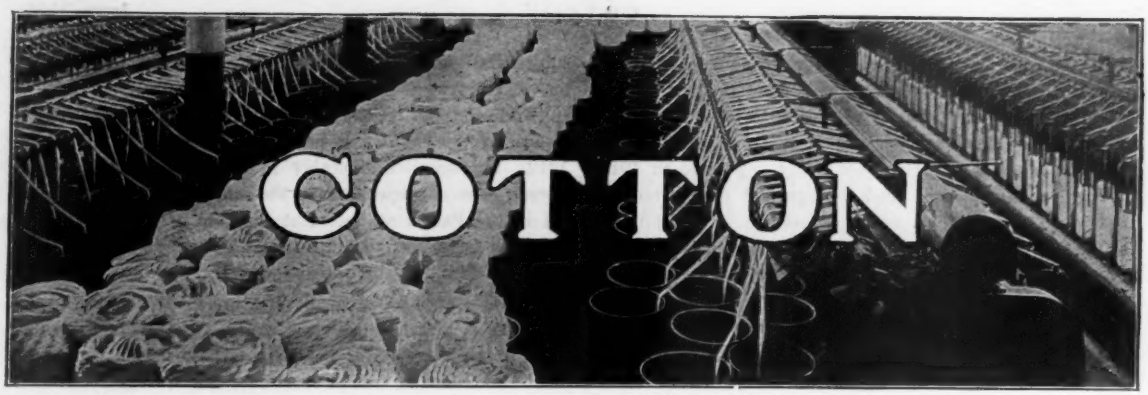
AMONG COTTON'S READERS



C. S. Tatum, Superintendent,
Bonham Division,
Consolidated Textile Corporation,
Bonham, Texas.

"COTTON has so far outstripped its competitors that it has long since ceased to be a debatable matter what is the best textile journal published in the United States."

C S Tatum



June, Nineteen-Twenty-Four

The Political Outlook.

With the national conventions at hand and the Presidential election less than five months away, the lines marking the political divisions of the year soon will definitely form. Barring what an effective third party may do, the outlook is not for a campaign marked by clear-cut issues. In that event the result will be largely a matter of pitch and toss, depending more on fitful chance than the operation of gaugeable forces.

An effective third party may give point and substance to a campaign that otherwise promises to be rather dull and empty. A third party can be highly effective without being in itself successful. There is no liklihood of a third party developing sufficient strength to command more than a handful of Presidential electors and members of the next Congress. It is doubtful if one will be able to achieve even that much. It all depends apparently on one man, Senator Robert M. LaFollette, of Wisconsin. LaFollette is now an old man, worn by an unusually active life and in a state of health by no means good. A word of affirmative encouragement from him would give body to a third party movement that might be effective enough to change the result of the coming election. Active espousal on his part would almost certainly raise such a movement to that degree of importance. And if he should consent to lead it, the movement might not only decide the election as to the Presidency but quite probably would succeed in gaining a balance of power in the next Congress. In fact, a third party lead by Senator LaFollette now holds what verges on being a balance of power in the present Congress, though most of this force functions, as the Senator himself does, in nominal adherence to the old parties.

LaFollette seems to comprise the one element which can cement the bulk of political insurgency now abroad into anything like a cohesive and effective whole. Without the binding force which he alone can supply, the third party rampages of this year will be confined to a few states and in these they are unlikely to be very formidable.

The fact that an effective third party movement seems to depend on the decisions of a single man is itself an indication that this factor will not be of great importance in the campaign and election. For, as Senator LaFollette —astute politician that he is—has said, third party movements that get anywhere evolve spontaneously. This is true of all the third party movements of the past which affected results in substantial extent. The one exception may be the Bull Moose enterprise of 1912, which, as with current insurgency, depended for life on a single individual.

While no real third party has ever won a national election—the Republican was never a third party, being of second rank practically at its start—history would indicate that nothing else may be looked to more certainly to actually decide a Presidential contest. And as conditions have been since the Civil War, third parties of account help the Democratic and injure the Republican party. Excepting Wilson's second election in 1916, no Democrat has been elected President since 1856 except by grace of a third party or a movement tantamount thereto. It was the Mugwump movement in 1884 which made Cleveland's first election possible. In 1892 the Populists, by drawing heaviest at strategical points from the Republicans, as a real third party this year would do, threw the election again to Cleveland. A similar situation brought about Wilson's election in 1912. A real third party movement this year would be strongest in northwestern states which normally are overwhelmingly Republican. It might carry some of those states, which would be a half victory for the Democrats. It would take from the Republicans in many states enough votes probably to throw many electoral votes to the present opposition party.

Aside from the effect of a third party fluke, it verges on the futile to try to predict the result of the coming election. It partakes not of partisanship to assert that normally the country is Republican. That is to say, that, while a majority of all the voters may not prefer that party to the Democratic, Republican voters are so distributed as to make what is equal to that in fact. It is truism among skilled Democratic strategists that the Democratic party can win a national election only by aid of Republican votes cast for the Democratic ticket or deflected to a third party ticket and thus neutralized. This basic condition is accentuated by woman suffrage, a fact which few students of politics have taken into account. For example, for the Democrats to win a nominal Republican State like, say, Illinois, something like twice as great a lead must be overcome or offset as before woman suffrage became national. For there is nothing more demonstrable than that women as a whole line up politically just as men do.

In the absence of a third party of sufficient appeal to draw from the g. o. p. enough votes to throw the election to the Democrats, will as many Republicans as may be necessary to Democratic success turn from their party? This may happen as such undoubtedly happened in 1916.

The Democrats have much background from which to "view with alarm." Unsavory disclosures in Washington during the last year have involved Republicans more than Democrats. Without Calvin Coolidge as an offset, these disclosures alone probably would make a Democratic victory reasonably certain. But the Republicans have an undoubted asset in Coolidge, who can command most of his party's assets without incurring all of its liabilities. The country seems firmly convinced that Coolidge is honest and common honesty is apt to be the virtue esteemed highest by most voters when choosing a President next November. The Democrats may off-set the Coolidge asset by nominating a man in whose honesty the country equally believes.

In any event, as between Democrat and Republican the men who head the tickets are going to be of more importance than the more or less fabricated issues between the two old parties. On fundamentals, both parties will be reasonably conservative, the Republican somewhat more so than the Democratic. Extreme radicalism will have to find expression through a third party. The Democratic will accuse the Republican party of many high crimes. Much of this will partake of the ancient dispute between the pot and kettle. Neither party has a monopoly on honesty or ability. One has only to examine votes cast in this Congress to see how each party has been as eager as the other to spend public funds for votes, as in the cases of the soldiers' bonus bill and the pension measure vetoed by President Coolidge. Each has been as avid as the other for futile compromise when dealing with economic problems. In support of good measures, omitting perhaps those of purely fiscal character, as to which the Republicans always lean most towards soundness, one has been about as prominent or negligent as the other.

At this writing, candor compels the close observer to say that on account of the Coolidge asset the Republicans still seem to have a slight advantage. This may be more than overcome by the actions of the Democratic convention—and may be annihilated by a word from Robert M. LaFollette.

The National Wealth.

The United States Census Bureau estimates the national wealth as of 1922 at, in round numbers, $320,000,000,000. In 1912 it amounted to only $186,000,000,000, an increase in ten years of 72 per cent.

This increase, however, is more apparent than real, a fact which is not fully elucidated in the bureau's preliminary report. Much of it is statistical only, being due to the cheapening of money and the consequent raising of prices and not in greatest part to additions to the nation's possessions. Inflation accounts for from 50 to 60 per cent of the entire statistical increase.

The research bureau of the Bankers Trust Company of New York estimates that the national wealth today does not aggregate more than $230,000,000,000 in terms of money values prevailing prior to the World War. This shows substantial increase, totalling about $30,000,000,000 for the ten years between 1914 and 1924.

According to Census Bureau figures the per capita wealth of the country is now $2,918 as against $1,950 in 1912. It varies considerably in different sections, being lowest, generally speaking, in the southern states and highest in the Pacific states. But the rate of increase in the southern states has kept apace and for some of these states exceeded that for the entire country.

On whatever basis calculations are made, we are by all odds the richest nation in the world. The average inhabitant of Great Britain, the next richest nation, possesses about $600 less of wealth than does the average American. The ratio is about the same for France. These, and, in fact, none of the nations involved in the recent war, excepting Germany, has much less in the aggregate than prior to the war, though their wealth has not grown as before the war. Even in Germany the per capita wealth, on a gold basis, is $901.

A Road to Terrorism.

One aspect of the Scandals of 1924, as staged in Washington during recent months, which seems to have escaped the attention it deserves, is that having to do with governmental and other secret service activities. There were many disclosures as to "shadowing" persons not only of the suspect class but also of the kind which various involved elements wanted to "get something on." Former official "investigators" for the Government blandly told of how even Senators were "shadowed" and their offices entered surreptitiously and searched for material which might be turned against them politically. One Senator prominent in the conduct of an investigation was even indicted as the result of information dug up largely by Government secret service men. It seems that secret service agents of one branch of the government often shadowed similar investigators of other branches. Much of this was merely "Old Sleuth" stuff, being in itself of no great consequence. However, as an indication of governmental tendency it is of compelling and threatening import.

Whatever may be said of the necessity of some measure of secret service activity being countenanced by the Government, all history shows that in no other direction can government tread such dangerous paths as are those dark and devious ones which are followed only by the secret official investigator. Until within recent years, governmental secret service was viewed as abhorrent to the American idea. Official spying systems seemed suited only to governments like those once maintained by the Russian Czar and the German Kaiser. For more than a century all that our government maintained consisted of a small group of detectives to trail counterfeiters. Even President Roosevelt was once accused, and not baselessly, of misusing the vague power given officials who are entrusted with the direction of secret service operations.

In less time than twenty years, the Government's total number of investigators of the more or less secret service kind has grown from a hundred or two to many thousand —some estimate the number at more than 40,000! In addition to hordes of inspectors whose work is open but whose authority to inquire is vast, practically every department of the government now maintains an "intelligence

unit" which is only a polite term for the kind of mysterious and irresponsible sleuthing first introduced on a large scale to government by Fouche, Napoleon's great director of police. How Napoleon came to fear Fouche's spies and was compelled to check them with other spies, how his system of governing came to be dominated by overlapping layers of spies until the people were terrorized by fear and suspicion only illustrated what since always has proved true, which is that secret services are dangerous to all concerned. Carried beyond the point of barest necessity, they grow and spread in ways cancerous to the body politic. The war gave the secret service idea its present deep rooting in our government. But the soil for its growing had long been cultivated through the extending of governmental surveillance to manifold private business activities.

It would be better in the long run for some wrongs to go undetected and unpunished than for the liberties of the people to be undermined and the government itself threatened through the development of big and imponderable official secret service machines. Its very nature makes a secret service organization irresponsible and subject to misuses which cannot be controlled. No government deserving existence ever needed to make extensive use of spies in dealing with its own people, or, with the possible exception of war times, with other people.

The Unseen Leak

BY W. R. TUTHILL.

One of the greatest factors in marketing is transportation. All production is dependent upon marketing. Unless the output of a factory can be economically and profitably marketed all efforts in production are of no value. It is not the purpose of this article to take up the various factors that enter into the marketing problem, but there is one that is of so much importance that all stress shall be put upon it.

Transportation, as it affects marketing, is the real subject of this article.

It enters into the cost in many ways. It begins to manifest itself in the cost of cotton, coal, mill supplies, dye products, sizings, machinery parts, in fact, all incoming shipments and takes a final toll of the finished product as it goes out to the final market as far as the mill is concerned.

There are rates, and routes, and zones, and combinations, and classifications, and packing, and shipping, and dozens of other things that must be known in order for a business to avail itself of the best and cheapest means of transportation.

There are State Commissions, Interstate Commissions, state laws, interstate laws, railroad rules and regulations, revisements, rearrangements, modifications and many other complexities that someone should know for the interest of buying, selling and delivering of goods.

Many industries and corporations know this and have a traffic man who looks after their own particular products. Others realize it, and allow traffic bureaus, "rate sharks," and local railroad agents to look after their transportation business. Others form themselves into an association and employ a traffic department to look after their interests.

Others realize that it is important, but believe they can secure the necessary benefits by letting their brother industries attend to traffic matters for them and "get by" without any cost. There are others so slow that they have never discovered the "Unseen Leak" in their business. They say they buy all materials delivered, and sell all products f. o. b. factory, so why should they worry?

The real motive that prompted this article was the checking of a prepaid freight bill on cotton in bales. The freight was about $135.00, and there was an overcharge of $42.00 in freight on this cotton. This money or overcharge was due the shipper and not the consignee, you will say. If the shipper could sell cotton at the $135.00 charged freight rate and make a satisfactory profit and be satisfied in his ignorance, he could have sold it at $42.00 less than the $135.00 charge for freight and let his customer have the advantage of that. How much does that amount to? One-eighth of a cent per pound on forty-seven bales of cotton. I know very little about the sale of cotton, but I *do* know one-eighth of a cent a pound either way, often makes a sale or loses it.

This is a real case taken from the files of a traffic bureau, and there are other cases of similar nature with even greater overcharges. This case came in today. Do you think this factor in any way affected the mill to whom the cotton was consigned? It comes back in another form when we go to market our goods and ship "freight collect."

This has been a year of close margins. Very close buying has ruled the market. It has been possible for a difference in freight rate to be the determining factor in a sale. If the manager has the correct rate he is in an intelligent position to act. If he has an approximate knowledge, or is dependent upon some unreliable source, it is a hazardous position for himself and his factory.

If goods are sold f. o. b. there is no positive position of value there, unless the seller can state positively his rates and guarantee them. There are certain specific rates on all commodities and between all stations, or there is a plan whereby these rates may be established. If they are established by neophytes or experimenters, or in a careless way, there is no reliability in the information. The carriers will always check all freight bills to see that, at least, their interests are protected. If too much freight has been charged, it is a problem for the shipper to find out, and not for the carrier to rectify.

There are many things that happen to freight rates that the inexperienced can never know. There are several things that can be mentioned, and not explained, except by an expert traffic man. It may be said before mentioning these several things, that not all traffic men can explain them. Traffic has become so complex and complicated that a traffic specialist must explain them, as various classes or groups of commodities admit of changes and modifications peculiar to them and their territorial distribution.

1. Rates are supposedly based on distance, junction points, competing lines, size of shipments, comparative costs, etc.

2. They are also based upon kinds and classification

of commodities.

3. They are also based upon kinds of packages, bulk, method of shipping.

4. They are also based upon routings, etc.

5. They are always being revised.

It is necessary to know more than rates. A man may know traffic conditions and transportation requirements locally, but be entirely uninformed as to what they are in other sections through which, or into which shipments will be made.

The traffic man must have much authoritative and technical knowledge of the rights and duties of the shippers and the carriers under the Interstate Commerce Law.

The local railroad agent or freight agent is a busy man, and has not the time or inclination often, to study the advantageous shipping of commodities. He is employed by the railroad to look after their interest, and it is his duty that he should do this first and foremost. If he does this job properly, he will not have time to be a traffic man for any private corporation.

Again, it may happen that certain railroads are silently formed into a favorite relationship in the manner of routing and handling of freight. This may or may not affect freight rates. It may affect time in transit. Today, rapid shipments are demanded. The agent may disregard this fact entirely through ignorance or instructions of those higher up.

There are other errors that may occur. Shipments may be classified wrong. The following is an example of erroneous classification.

The rate on Burlap from New Orleans to Columbus, Ga., in bundles is Fourth Class ninety-six cents per hundred-weight; in bales Fifth Class seventy-nine cents per hundred-weight.

The usual way to bill this in a railroad office would be "5 Bls. Burlap"—and "Bls." may be interpreted to mean "bundles"; therefore, if billed "Bls." the agent at destination should apply Fourth Class rate, unless he knew the shipment was in 'Bales,' and ordinarily the rate clerk does not see the actual shipment, but rates as per the Bill of Lading or Waybill; but burlap is usually shipped in bales and the difference in the rate is seventeen cents per hundred-weight.

Another case of possible error in shipping is illustrated by using Paint in less than carload lots from Atlanta to Macon, Ga.

Dry Paint, usually shipped in Barrels or Boxes—as per Southern Classification is Fourth Class, and the Fourth Class rate from Atlanta to Macon is forty-five cents. Suppose the shipment weighed 5000 lbs. There is an exception to the Classification in Georgia, making this article in carloads Class L, which is $2.03 per ton, minimum car ten tons.

5000 at 45c per cwt. equals	$22.50
2000 at $2.03 per ton equals	20.30
Difference in favor of CL rating	$2.20

In class rates and commodity rates information is necessary in order to be able to take advantage in making shipments.

Class Rate versus Commodity Rate:

There is a chemical and dyestuff rate from Virginia cities and Eastern points.

Sizing, for instance, in paste form in barrels, is ratable as Fourth Class.

Fourth Class from New York to Rome, Ga.,

Via all rail route	$1.21
Via rail and water route	1.15

While the commodity rate via all rail route is 88½c and rail and water 81c.

Improper packing affects rates.

Rule 5 of the Consolidated Classification specifies the thickness of material, and other specifications of materials used as containers. When shipping goods in cartons or boxes or containers made of pulpboad, fiberboard and composition material, this information should be known. Shippers use these materials for the reason that they are light and often cheaper than wood, and the shipper is supposed to stamp the Bill of Lading, saying that the containers comply with the requirements of the Classification. If it does not comply, or if he fails to stamp the Bill of Lading, the rate increases twenty per cent.

Suppose the First Class rate from the Ohio River Crossings to Macon, Ga., is $1.51 per hundred-weight. If packing requirements are not complied with the rate will be $1.81, which is an increase of thirty cents per hundred-weight.

An error in routing may be illustrated by a shipment moving from Detroit to Columbus, Ga., with specific instructions that shipment shall move via New York Central Lines to Cincinnati and Southern Railway to destination. The First Class rate would be $2.43½ per hundred-weight, but if the shipment was unrouted or routed through Louisville, Ky., the rate would be $2.39½ or four cents per hundred-weight less, and the time would be about the same.

Quite often a plant is established at some small station, and they manufacture an article that has not been made at this station before.

Of course there are no rates on his raw materials into the town, and no rates except class rates on his manufactured articles. The Traffic Manager knows how to establish with the carriers rates in and out of the town so that he will be on an equal with his competitors.

Sometimes it pays to ship a car of products to a shipping center, and have a storage house re-ship locally. Suppose you had a lot of 50,000 pounds going to local points in a foreign State and you had a carload rate to some central point. No doubt it would pay to ship in a carload quantity to this point, and ship locally to the local stations. Often times the saving will justify this manner of shipping.

The Traffic Manager knows how to figure the results on a shipment of this kind.

The market cost of an article depends upon the cost of production, cost of selling and the cost of transportation.

The selling price represents the market cost, including the profits. No explanation is needed to show that any change in transportation costs affect profits.

If transportation costs are lowered, the market cost can be lowered, or profits increased as the case may demand.

If transportation costs are good in a wide area, the selling area is widened and the probability of sales is increased. As has been said before in this article, transportation costs are not the same in all areas, hence in highly

competitive markets transportation is often a determining figure.

Sometimes there have been discriminations, not intentional. but arising out of the attempted readjustments. An efficient traffic man is the only one who can detect these discrepancies and have proper adjustments made. Sometimes a new rate can be affected by another routing or combination, or classification. The traffic man knows this.

Transportation enters as a cost factor in the market problem in another way.

Everyone who sells an article knows that repeating orders are less costly than new orders. New business is nearly always expensive to secure. Rates, routing, condition of shipments, time in transit, are some of the determining factors as to the amount of repeating orders that will come in. In this way it seems that a traffic man is almost as necessary as a salesman.

The traffic man makes it possible for the salesman to approach his customer.

In spite of all the care that can be taken there will be occasions of overcharge, damages, delayed shipments, improperly classified shipments and many other details which are a constant drain—The Unseen Leak—in any business. The layman cannot detect these, and in ignorance he goes on with this loss of hundreds and thousands of dollars, slipping surely and steadily out of his business. In this one phase of work alone, the Traffic Department of your association, if you belong to an association, saves its members thousands of dollars each year in looking after overcharges, claims, damages, goods lost or delayed in transit. What it saves them in advice about rates, routes, classification, methods of shipping, etc., cannot be calculated.

This is a complex world in which we live. Technicalities and fine points are determining factors in our accomplishments. It is impossible for one mind to grasp in detail all of the essentials necessary for conducting a large business.

Market areas are broad and expansive. Conditions are variable and complex. They must be met as they are, and not as some would like for them to be. A traffic man is not a luxury or a fad. He is an absolute necessity. He is a pioneer of progress; he picks the path for new fields. Many large organizations realize this and are availing themselves of his services. There are others who have never found "The Unseen Leak," so they let some of their earnings and potential customers go into other channels because of their ignorance.

Business may be a little bad, profits may not show what they should, management may be a little blue. Suppose you look for the leak. Perhaps a good traffic man could help you. He could help you by showing you the leak, if it should exist, or by assuring you that it was not in your transportation field, if it did not exist there. Definite knowledge is worth something.

Finally all will agree that a traffic man is necessary, but there are independent traffic bureaus and organizations that will do the work of the mills on a percentage basis.

This means that they will take the incoming and outgoing freight bills and check them on a 40-60 or 50-50 basis. This can be done more cheaply than employing a traffic man or belonging to a traffic department of allied interest. They will probably find errors and make claim for overcharge, but their success depends upon errors. They will not correct the errors, or show wherein they have occurred. The traffic man does all of this and in addition he advises the various organizations, or the individual organization how to prevent these errors. He is the constant advocate who represents the organization before the State Commission, Interstate Commission, the railroads, legislatures, etc. He studies markets, discriminating rates, how a change in one section will affect another. He makes rates and schedules into new territories. He advises with the organizations constantly, as to the best means and methods of shipment. He is a specialist. Goods delayed in transit are speeded by him. Goods lost in transit are looked after by him.

It may not be amiss to summarize in a few sentences the importance of a traffic man or a traffic department.

1. He knows railroad rules and regulations.
2. He knows State and Interstate Laws.
3. He knows how rates are made.
4. He is informed as to revisions.
5. He knows routes and classifications .
6. He knows how to pack and ship.
7. He traces lost and delayed shipments.
8. He watches rate changes in wide areas and often is able to offset undesirable effects on local conditions.
9. He knows how to appear and plead before the various commissions and committees.
10. He corrects errors of all kinds and advises how to obviate them.
11. He is your constant advocate on transportation.
12. He makes old sales repeaters.
13. He makes new sales possible.
14. He saves you time and worry and expense.
15. He gives you dependable information.
16. He saves you thousands of dollars each year.
17. He stops the "Unseen Leak."
18. He is a necessity.

Doubtless, your association has a traffic department. Are you an active member, and enthusiastically supporting it? It exists for your benefit and in return it expects your support.

A new booklet of the Bureau of Standards, Department of Commerce, discusses some emissive tests of paints for decreasing or increasing heat radiation from surfaces. Copies may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents per copy.

In connection with the recent starting of operations at the new Greenville, S. C., plant of H. W. Butterworth & Sons Company, J. Ebert Butterworth, treasurer, who is in charge of the southern office located in the Woodside Building, Greenville, stated that the foundations for the large presses are now being made ready, and that they will soon be in position to re-fill rolls. The original plans were not to take in outside work, said Mr. Butterworth, but they have decided in response to requests to place the entire facilities of the southern plant at the disposal of the southern mills.

Scientific Trends With a Textile Slant

1. More Finished Goods.

In a memorable address to the American Cotton Manufacturers' Association two years ago General Tyson urged the southern cotton industry to turn more of its effort to the production of finished goods, this as a means of realizing a higher percentage of returns from their units of production than could be done from white goods alone. The shortage in cotton of the last two years, together with the consequent high price of this staple makes this warning of an almost prophetic nature if the southern industry is to realize maximum profit from the results of manufacturing activity on a commodity which costs so much initial investment for the raw material utilized in its products.

Faced for the first time with the problem of producing colored goods, the white goods man may well be appalled at the technique and paraphernalia required to produce this more advanced line of manufactures successfully. This is especially true where yarn-dyed goods are required. However, the development of the past few years in package dyeing has produced some notable equipment that has markedly lessened this problem to the mill manager.

Rather extensive surveys of conditions in colored goods mills that have been producing for long periods would seem to indicate, however, the need for an even further development in equipment along these lines, particularly of a kind that would enable *continuous dyeing* of single threads rather than merely dyeing of packages of yarn in close assembly. There are very many reasons for this conclusion, chief of which is the manner in which yarn is handled in mills that now have no yarn-dyed work. The field for such a machine as suggested would certainly be most opportune in those mills which are considering the changeover to yarn-dyed colored goods.

It would be interesting to have an expression of opinion from the management of such mills as to whether the cost of installation of equipment to cover the additional operations *preparatory* to skein and package dyeing have not been a serious factor in the deliberations attendant upon such a contemplated change.

It is a significant fact that one of the largest producers of *colored goods* in the South was one of the first to close its books to further taking of orders, this season, owing to having completely filled its productive capacity.

2. White Goods and Mercerization.

No single fact in the whole textile industry of today is of more growing importance than that a balance will soon be struck in the matter of price, consumer demand and the types of materials best suited for makeup into the various requirements of fabrics. The economic certainty of this has been merely hastened by such influences as the boll-weevil, the lowered price of artificial silk and the advent of large quantities of foreign manufactured items of clothing.

In the face of this condition where is the industry heading which produces 100 different (and disagreed upon) standards of quality in such staple matters as bleached whites and mercerization? Staples produced for a particular market are competitive in two factors, price and quality. Price is fixed by costs of operation, raw materials and the market situation but the amazing thing is that the advantage of having fixed standards of quality in these two factors of manufacturing has not been apparent to competing manufacturers in this field. The effort wasted on representation and advertising that the quality of one's product is the equal or superior of one very close to it in grade is destructive tactics in the face of an outside competition that is determined upon the domination of the field both these allied manufacturers are aspiring to.

The remedy lies in laying down accurate *measured* standards, with names attached to each grade, and then selling the goods under the corresponding branded equivalents in quality. There is no profit in misdirected optimism of the kind which puts its money-energy into advertising out of its rightful field rather than upon amplification of its facilities or raising its standard of production quality.

Moreover, science has provided ample means for the registration and grading to fixed standards of inspection of the various degrees of these factors mentioned so that the course open is plain, as well as being good business.

3. Mill Lighting.

It will pay the management of any textile mill to keep in touch with the sources of reliable information on good lighting practice, this in view of the fact that advancement in this line is being made in such rapid strides by a number of reliable organizations that in order to be able to discriminate between the claims of rival manufacturers of equipment requires one's being thoroughly posted on best standard practice in both principle involved and design of the fixture.

Proper lighting of work is a tremendous factor in the rate of production, lowering of accidents and raising the standard of quality of product. A great many specialized types of lighting equipment are now available for the various demands of the many departments of manufacturing, but even the mill having only one type of work should pay attention to seeing that that one type is lighted in the most efficient and economical way.

Many benefits result from making the lighting system

It is a far cry, perhaps, from the little mill village of a few houses and the struggling mill community that is growing up there on the foundations of ambition, determination and the spirit of pioneer workmanship—to the cool, stately university campus where, in the shadow of its great trees, other men, with equal qualities of consecration to work are bringing a living force into the light of day.

You in the mill, with the endless details on your minds and hearts, concerning men, money and materials will soon feel the effects of these forces. Yesterday's discovery is tomorrow's pocket standby.

We can afford, therefore, to pause a moment to consider the life and work of one of the greatest workers of all of these, who has just passed from among us. Ernest Fox Nichols finished his career after most important and far-reaching contributions to the establishment of the relation between all radiant energy, heat, light and electricity. Upon the structure he built will rest, undoubtedly, many developments of utility in industry and better conditions of living for us all for some time to come.

The lesson of his life's achievements should cause us to give every encouragement to the work of the scientists struggling along in our local institutions and assist them in every possible way by practical cooperation with their efforts.

right, not the least of which is economy of maintenance and replacement cost most consistent with the type of output accomplished from the various departments.

Of course, very specialized problems require such careful treatment as to necessitate the services of an expert in such matters, but much helpful information for the solution of everyday problems of buying, installation and maintenance may be obtained from the bulletins issued from the following sources:

The National Electric Lighting Association.

The Illuminating Engineering Society.

Service bulletins of the large electric supply companies (obtainable through the local power company).

The American Safety Institute.

Bulletins of large manufacturers of white paint, together with many articles in the current trade journals.

4. Auxiliary Machinery.

Most of us have enjoyed the entertainment afforded by the slow-motion moving picture that has become a feature of a great many programs for the last year or more. The question is whether we have appreciated fully the possibilities in this sort of thing.

How many times in the course of mill work questions of this kind have arisen:

"What part of that machine is getting all the strain and wear of the load?"

"I wonder if that part is 'hitting' evenly all around?"

"Why doesn't that belt on the third frame work as well as those on the first two?"

"What makes that shuttle miss-fire and wabble in its path?"

A thousand ways suggest themselves to find out, but every good machine man *knows* that running the operation at slow speed does not give a comparative basis of studying what happens at full speed.

Now appears a device by means of which moving machinery can be studied, at will, at all its speeds, and the device is simple, portable and practical. Is there a thorough-going mill man in the industry who can say he has never seen a need for such a thing? Ask the master-mechanic and boss fixer.

What seems to be the most important function of this device is that it saves production time while the cause of troubles is being discovered because there need be no shut-down in work to discover it and often no take-down of the whole machine for this purpose, the trouble being located on the very part which, alone, has to be readjusted.

Here is an aid to the mill man which needs little instruction to put into use and may save much temper and considerable cost in the course of a very short time. Simply operated it can be carried about and used on any location where light sockets are found.

It is also a most efficient means for the detection of faults in rapidly running yarn and cloth at *any stage* of the manufacturing operations.

5. Raw Materials and Agriculture.

We are all apt to get into the dangerous habit of thinking solely in terms of money economics rather than commodity economics. That might be all right if we were all great financiers. But sometimes, as the old mechanic said to the inventor of a perpetual motion machine, "It's fine but it ain't so!" What good are gold eagles to castaways on a desert island?

The best indications of all the studies made on the subject point out that continuance in any line of manufacture from a raw staple is inseparably linked with a consistent policy for the development, protection and improvement of the *supply* of that material. The lessons derived from expensive research and even more dearly-bought experience are hard to set aside. A more consistent policy of agricultural development must eventually be the salvation of the cotton industry. Just as no one man's tax rate fails to affect his neighbor so overstressing the manufacturing side of the cotton industry and trusting to market manipulations to control the problem of the price the manufacturer must pay for his raw material are shown to be impotent means of meeting the condition which years of neglect of a sound policy for protection of the sources of supply of the basic material have brought about.

Nor is the remedy to be found completely in a government department acting in the function of controller of the problem. He would be an optimist indeed who expected salvation from all his troubles through the activities of such departments as recent months have disclosed to have wandered so far from the essential idea of service. It is true that of all the departments of our government the Department of Agriculture is one that has always stood among the highest in ideals in this respect. But the idea is fundamentally wrong, leaving as it does, so much of an opening for political temptation and the other evils of bureaucracy.

This is rather more properly a function of the activities of the manufacturers themselves and they should have a competent central plan and budget for its control. Every great corporation does this to insure its own continuity. A group industry but multiplies the details of the problems of a great corporation while its general problems of policy are the same. The cotton industry as a whole is the greatest corporation in America.

At the Southern Textile Association meeting at Blowing Rock, N. C., on June 13th and 14th, an innovation will be the offering of golf and game prizes by the Association. In golf, a low individual medal score and a first and second individual handicap score will be given, as well as a cup for the lowest total state team score composed of four men from each state—men with handicaps below 16 not being allowed on these state teams. Another feature will be a prize for the man who makes the longest drive on the first time at No. 1 tee, and a prize for the man who never played golf who makes the longest drive.

Game prizes will be given to the winner for a checker tournament, a set-back tournament and a bridge whist tournament. Thus there will be somebody for everyone—even as you and I.

Technical speeches on subjects of pertinent interest will occupy the Friday morning session. Four- and six-roll drafting will be discussed by A. N. Sheldon, of Providence; sizing will be discussed by Dr. J. M. Widner, of Penick & Ford, Ltd.; and George W. Foster, of the Universal Winding Company, will speak on winding warp and filling yarn for weaving processes.

On Friday morning, Luther H. Hodges, of Spray, N. C., will talk on "Labor Turnover," and the closing feature of the meeting will be an address by Rt. Rev. E. A. Penick, Episcopal bishop, on the relation of the church to industry.

Watt Tell and the Firecrackers

The Tenth Modern Fable

NOT BY AESOP.

Weather like this naturally brings up fond recollections of winter time. Draughty windows and leaky shoes attain a pleasant dimness of perspective along with frost-bitten noses, snow drifts, chilblains, flues that wouldn't draw and cold winds that whistled down collars and up pants legs. The furnace is no longer a coal gobbling glutton, but a good cool place to keep butter and eggs in, the water faucet by the kitchen is changed from a frozen anathema to a fine thing to stand under after a day's work and the Christmas tree that bloomed a radiant burden of about two months' salary—

Where is that tree? Out behind the wood shed probably. No, there it is with the branches lopped off, serving as a center prop to the clothes line. Sad and ignominious end. Something like a good many folks, that tree. Giant of the forest, you know. Selected for a position of trust faithfully fulfilled, a burden of honor nobly borne. Then—discarded, forgotten, a prop for dirty linen. Lot of room for a little moralizing there if we had time, but it sure was a noble tree when it was all lit up with colored candles and a great big firecracker tied "way up to the top where Nip couldn't reach it.

Nip is the son and heir. Present tense. Nip liked it, and so did Tuck. Tuck was a long legged, ubiquitous dog of doubtful lineage. Past tense for Tuck. The firecracker was a concession to a fast dying custom and was put up as high as possible in the hope that if seen it would be out of reach. Naturally they fastened to it first thing. Nip was holding it carefully behind him out of harm's way when it took a mean advantage of him and connected with a lighted candle behind his back.

Perversity of inanimate things. *Pfss-s-ss-s-*

Drop it Nip! Throw it down. Out of the way, dog. Throw it on the floor, Nip! That's the boy. Hey, dog, leave that be. Don't you pick it up! Hey, hi! Run everybody. Get away, mut. Don't you follow *me* with that thing. Run like the dev—

BLAM.

Nip can't hardly stand to think about it yet. For a long time he couldn't sit and think about it at all. Tuck could hardly be blamed for picking it up and running after him with it. He had been trained that way and didn't know any better. Fortunately Nip was traveling in high and the only thing that was damaged was the bosom of his pants. Gross loss, one dog, one pants bosom, one firecracker, one and one-half square inches of boy skin. Tare loss, most of the pants. Net loss, none. The firecracker was made for the purpose and could hardly be listed as a loss in fulfilling its destiny, the skin grew back, the pants were sewed up and the dog wasn't any good anyway.

The main objection to a firecracker is that it is no respector of persons. It is a lowbrow sort of thing, originally invented by the Chinese, with no sense of politeness at all and only one idea and it's the most persistent thing imaginable once it gets started. It won't argue; it won't listen; it won't wait for leave nor grace; it goes and busts regardless. And it's a good thing to stay away from.

Lots of folks like that firecracker, too. The tree is a thing of the past now. No use to waste breath moralizing about it. As a clothes pole it has attained a more serviceable place in society than most of us get to. There let it stand, secure in its utility. But that firecracker—

Did you ever see folks with a firecracker disposition? Physically some of them, mentally most of them, a whole lot more of them both than is convenient or comfortable. They go along quietly enough without apparently any thought in their heads, any itch in their fingers, placid, passive, inert, without even the warning red wrapper on the outside which indicates the nature of the real firecracker, and then all of a sudden something connects with their fuse and off they go and the devil's to pay.

Something turns up to be said. Perhaps it would be better not to say it just then. Something turns up to be done. Maybe not right then, but after other things are done and all is ready. Something is to be decided. Most of the time the decision is not wanted just then, but whether it is or not you're going to get it. No matter what the effect is, language is going to fly, work is going to be shoved around, a decision is going to be made right now no matter how important or complicated. Whatever it is will be attended to now, right away, pronto, quick and immediately.

You'd better duck. You'd better reach up for your sky piece and hit for the tall timber. If you happen to be one of these immovable objects, you'd better resign the position temporarily and abscond forthwith, because the irresistable force is on its way and is not to be denied. Lope, gallop, fly, run and slide, crow hop or dog trot. Get out of the way somehow, anyhow, and stay hid until the detonation ceases to detone and the reverberations have quit their skittering around the welkin, because the firecracker is agoing to bust and unless you want to join the general scatteration you had better not be there. Then after it is all over you can come back and pick up the pieces and try to put them back together, because more than likely something will be blown up that shouldn't have been.

Of course there always comes eventually a time when things must be said or done or decided and it is not to be denied that the prompt and accurate meeting of the emergency is the very apex of human endeavor. It is the high moment for the successful encounter of which we have been struggling upward through the muck of long ages of doubt, of wonderment and of fumbling mental conceptions; a moment which we can now meet sometimes with certainty and precision, but which we still more often blunder through blindly with occasional good luck and frequent failure. Not that we all think that way about it. Most of us think we are as accurate as a split second watch and as forceful as a steam hammer and go right ahead acting just as if we really were. The trouble with us is that we all want to think that we are better than we really are. That's a mighty good thing, too, and very often makes a man better than he is. It is a great gift to be able to do things promptly and right, to use the proper judgment on all occasions, and here's to all of us who take a whack at it as often as pos-

sible, but it is something that none of us have yet. Not all of the time, anyway.

When the time comes to make a decision quickly, to act or speak without previous forethought or calculation, when it is not the best course, but the only one immediately available, the method to pursue is the one used by the old man in selecting a wife, who shut his eyes, jumped and grabbed. As a noteworthy commentary on this line of procedure it is worth recording the old man's subsequent statement to the effect that whereas he was perfectly correct in shutting his eyes and jumping, when he grabbed was where he played Hell. Ordinarily a slow and cautious decision made after a proper weighing of circumstances, a carefully planned course of action, a prudent method of speech meets with the derision of the hair trigger lads, the firecracker folks who go so fast that they often meet themselves coming back, but it is the safest way and in the end produces the best results.

These boys with the bustling brains will fill you full of dope about old man Opportunity being hard to catch and the necessity of being on your toes all the time to get him as he skips by. They will tell you that he travels in a hurry with a long lock of hair in front so the wide awake folks can grab him as he comes, and no hair on the back of his head so the slow ones can't get him after he is past, and you will notice that most all of them have their hair cut that way in the hope that somebody who doesn't know any better will make a mistake in their favor. If old man Opportunity ever wore a warlock hanging down over his eyes to spoil his sight and blundered around in search of haphazard partners he has changed his ways since all the firecrackers tried to look like him. He squats now in the rubble of good hard work as still as a little partridge in the grass and as hard to find. You will never see him accidentally, but you *can* find him by patient search and when you get him you will find that he has no hair nor any other hand hold, and if you want to keep him you had better wrap all around him, sink tooth and nail into him and sit right on him to the full extent of your heft. Otherwise you will soon be running around wondering where your little playmate has gone. Folks who grab things in a hurry as they come by will often find that instead of catching old man Opportunity they are tangled up with a blind young lady with a very doubtful reputation by the name of Chance.

All of which brings us to the manufacture of cotton in general and in particular, to the morning when the world seemed to regard old man Watt Tell, the superintendent of the Whatsname Mill with the impudent and triumphant expression peculiar to a tangled bobbin of roving that somebody has failed to get up straight and flung in a corner to get rid of. He is as good a mill man as ever had a shipment of cloth come back on him, but things didn't look just right that morning and got worse right away when he was sitting at his desk after starting time and saw the boss dyer galloping down to the front gate as fast as his long limber legs would take him. He has the loyalty of his men, principally because he knows how to talk and how to keep his mouth shut and when, but something in the sight of the dyer trying to argue the watchman into letting him through the gate lit a firecracker in his mind, and before he could stamp it out, it exploded.

"Hi!" he whopped, right out in front of everybody, "What do you mean, you slab sided simp, by coming down here a half hour late? Didn't you hear the starting bell, huh? Whaddy you think we ring it for, to wake you up with, huh? Can't you get your ears washed and your hair combed and be here on time like everybody else when the racket begins? What's the matter, you been up all night? I got a good mind to tell the watchman not to let you in at all."

The watchman laughed and two or three doffers standing near blushed. A belated spinner stopped up her ears and coughed her tooth brush over the fence. The dyer took the watchman by the neck and threw him into his little house and came into the office and banged the door. "Yes," he said, "I've been up all night. The yarn dryer broke down just as I was crawling into bed and they came after me. I got it going a little before starting time and ran out to get a bite of breakfast. If all the appreciation I'm going to get for a hard night's work and no sleep is a bawling out before everybody, you can take these keys and my little job and go to—"

But the boss was gone. As he flitted through the back door out into the yard he muttered "Firecracker" in an accusatory tone and deftly served himself a double kick. "Time's a great healer," he thought. "Maybe he will get over it if I stay away from him. I'll have to gather up the pieces and patch him together again after a while, but I'll leave him alone today and let nature take its course."

"Sir?" said the master mechanic.

"Firecracker," said Mr. Tell. "What's all those poles on that truck for?"

"That's to hold up the pneumatic tube we are going to blow the cotton from the opening room to the picker room with. Can't put 'em up yet because I can't line 'em up until I get the new opener in position."

"Piffle! Line them up now and go to work digging your holes. Here, I'll sight for you. More time lost around this place on foolish excuses than Pat spent in the army. Dig them right along here and get busy."

In the card room the overseer complained that he was out of chalk to mark his roving with. "Phone down to the hardware store," said the super, "and tell them to send up a dozen boxes of each color. They have just gotten the agency for some chalk and I promised to buy from them."

"Don't you think we ought to try a little bit first?" asked the carder. "You know that chalk may be too hard for us to mark the roving with."

"No!" snapped the boss, "you go and do what I tell you. I know that it is all right, because they said so," and he followed the retreating form of the carder with a few general remarks about folks that were too cautious to pull up their pants for fear they would get their ears in the pockets. In the spinning room he found a line of frames stopped and another fuse got lit. He jerked the belts on all of them before he found out they were changing travelers. The spinner passed a few complimentary remarks about how long it would take him to get the ends all up again, grabbed his hat and departed officeward.

"Firecracker," said the old man. "A whole pack of them." He peeped through a window of the dye house, and seeing the dyer at work, sneaked around the back side and slipped into the weave room. As he went through the door he tore his pants on a box of filling standing in the way.

"Sir?" asked the weaver.

"Firecrackers," he shouted. "Shut up. Don't speak to me. What's all that black filling?"

"That's a little that got mixed. I've been afraid to put it in the solid patterns for fear it would shade the cloth. I'm holding it for some checks, so if it's different shades it won't show."

"Go on and put it in," roared Watt. "As hard up as we are for good filling you ought to know better than to let it sit around."

"But—"

"I'll but you in a minute. Don't you open your head. I'm going in the cloth room and see if I ain't got at least one man around here with a little sense."

In the cloth room a young man with a vacuous grin beat a spirited tatoo with a couple of bobbins on a packing case and drummed an accompaniment with his heels. *Pfs-ss-s-* "Here," said the boss, "how much do you make?"

"Twelve dollars a week," said the boy.

"Here's your twelve dollars. Now get out. You ain't worth it, but I'm going to give it to you to get rid of you. Hi!" as the cloth room overseer came in sight, "how long has this hunk of nothing been working around here, and what did you hire him for?"

"He doesn't work here at all," said the overseer. "He brought me a message from the other mill and was waiting for me to give him some information for the folks over there."

The boss staggered back out into the yard and the master mechanic caught sight of him. "I've got the opener down now," he shouted, "and all the holes are dug wrong. I'll have to dig a new set."

"Firecrackers," bleated the old man, and bumped into the card room overseer who had his arms full of chalk boxes and who managed to spill most of them on his head as they came together. "Now look what you've done," he complained. "It's bad enough to get stuck with a lot of chalk hard as bricks without having 'em all broke up so we can't take 'em back. Now what are you going to do with 'em?" Then the weaver came out to say that the mixed filling was streaking the cloth and could keep it up so far as he was concerned, and the three of them hooked arms and went to the office with the cloth room boss trailing after them.

Mr. Tell sat down and wept until the office boy came out to say that the president wanted him out in the office. "I ain't agoing," he moaned. "I just ain't agoing. All them overseers went out there and told a lot of things on me to get me fired." But he went. When he reached the office of the president, all the overseers stood up and the president said: "Mr. Tell, do you know what day this is?"

"No," said Watt, "but I know you're trying to make it the Fourth of July. If you think I'm going to stay here and be the fireworks, you're wrong. I'm quit right now," and he slammed the door and ran all the way home.

"Hum," said the president taking a handsome watch out of his pocket and polishing it on his pants leg. "Too bad. This is the anniversary of Mr. Watt's coming to work for us twenty years ago, and I asked all of you to be here so we could give him this watch as an appreciation of his long service, but something seems to be wrong with him this morning."

"Been acting sort of nutty," said the master mechanic. "Been talking about firecrackers. Maybe he's a little off center. I'll go find him."

"Never mind," said the president, giving the watch a final rub. "Too bad he jumped at such a foolish conclusion without waiting to hear what I had to say." He put the watch back in his pocket. "I need a watch myself," he added, "let the matter stand as it is."

Oh, yes, he got over it, and is back on the job, but it took a sight of mustard plasters and such. If you talk to him enough he will be sure to warn you that they don't tie firecrackers to Christmas trees any more, and that if you expect a good place on anybody's tree you'd better not be one. And some folks wonder some times what he means.

New England Mill Men Meet at Boston

The spring meeting of the National Association of Cotton Manufacturers was held at the Copley-Plaza Hotel, Boston, on Wednesday, April 30, and Thursday, May 1, and the arrangement of its program further demonstrated the effective manner in which the organization is now operating.

On Wednesday afternoon, the fore part of the first session consisted of business routine including the submission of reports, etc., and President Robert Amory, who presided, delivered one of his characteristically thoughtful addresses. The keynote of his statements was to suggest that the New England manufacturers adopt a slogan of "New England Made" for their goods. "In our present difficulties here in New England," he said, "why not take a leaf out of the importer's book? We recognize that the 'imported' has selling value. It sounds exclusive, and in the past, at least, it sounded like quality. New England goods also have had a reputation for quality. Why not use this method of the importers and capitalize 'New England Made'. New England is preeminently the producer of branded cotton cloth and it would be fairly simple to couple the words 'New England Made' with these well known brands. It would involve a closer control of our merchandising and more advertising. A considerable extension of work along the lines of the association's traveling exhibit would be comparatively inexpensive and should pay many times over in the additional demand for our products."

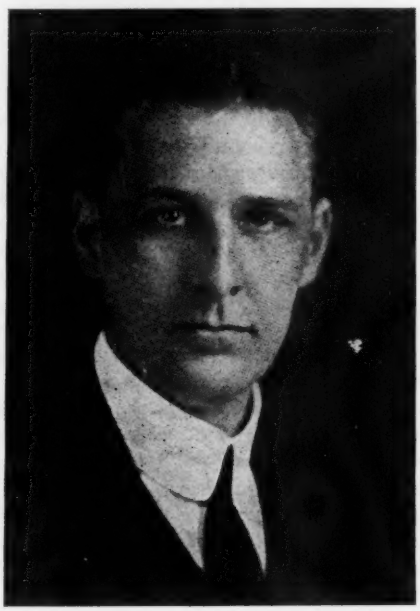
The latter part of the Wednesday afternoon session constituted a consideration of the subject "Cotton—and the Making of Industrial New England." The Chairman was J. A. Sweetser, and the first paper was presented by Secretary Harry C. Meserve, of the association, who discussed the founding and growth of industrial New England, in a historical vein. Magnus W. Alexander, of the National Industrial Conference Board, discussed the cotton industry as part of the national economy. Following the prepared papers, J. W. Sanger, United States trade commissioner to Australia, spoke on trade relations between this country and Australia in cotton goods and other commodities. The discussion of this general subject was continued at the Thursday morning session, under the leadership of Russell B. Lowe, when S. H. Thompson presented a paper on "The Community and the Industry," and Gerritt Fort, vice-president of the Boston & Maine Railroad, presented the rela-

tion of the industry and the railroads.

The traditional banquet was held on Wednesday evening, the speakers being President Amory and Samuel M. Vauclain, president of the Baldwin Locomotive Works.

On Thursday morning, the technical session was conducted under the chairmanship of James E. Coburn, agent of the Androscoggin Mills, Lewiston, Maine, and under the auspices of the Association's technical committee, of which Russell B. Fisher, assistant secretary, has charge. The prepared papers included a description by Professor George B. Haven of recent research work conducted at the Massachusetts Institute of Technology, with which he is connected.

In discussing moisture survey, Professor Haven described the Institute's method: "After subtracting the tare weight of the container, the moist cotton is carefully transferred to the basket of a textile oven and, after drying three or four hours at a temperature of 220 to 230 degrees Fahrenheit, the bone-dry weight is determined. Subtracting this from the moist weight will, of course, give the amount of water present. The term 'regain' has been officially defined as the percentage which this water indicates relative to the bone-dry weight. The term 'moisture content' is used to indicate the percentage of moisture in terms of the actual or natural condition. It is evident that the latter percentage varies with the chance conditions at the time of the test, while regain is based on a constant value, namely, that of the dry product. In many processes, due to the manipulation of the fiber, the moisture which may have existed in the bale or may have been artificially added in the form of an emulsion, is rapidly dissipated. Frequently, therefore, yarns and finished fabrics are nowhere nearly in their supposed condition regarding moisture.



President Robert Amory.

"The necessity of conditioning fabrics and yarns prior to tests for strength is no longer doubted," said Professor Haven, and this brings questions of how long it is necessary to hang fabric specimens or yarn skeins in standard atmospheric conditions before they will arrive at a substantial equilibrium. Professor Haven said their tests had shown that in light fabrics almost all the regained moisture is collected in the first 20 minutes or half hour of exposure and that one hour is a sufficient interval for any average fabric to attain its final weight—tire fabrics and heavy belting ducks, however, requiring much longer intervals of time to come to a balance.

The openness or closeness, or relative porosity of texture, is important in mechanical fabrics, the speaker pointed out, stating that a good sail duck should be strong, light in weight and as impervious to air as possible, while a felt or filter cloth, on the other hand, should have for its purpose a definite amount of porosity. Experiments on the ducks had not been carried out to completion, he said, but tests had shown that for heavy felts, air and water porosity were in very direct proportion.

Professor Haven next described the Bureau of Standards method of arriving at crimp in fabric. The original method applied more particularly to the heavier fabrics, while Professor Haven said they have modified the apparatus so that crimp in the fillings of shirtings, crepes, etc., using yarn as fine as 60s can be determined.

The speaker next discussed the development of a constant load-rate textile testing machine, and described a new type of testing machine as perfected by Henry L. Scott.

Secretary Harry C. Meserve.

Professor Haven concluded with a discussion of abrasion and flexure in fabrics. "Numerous queries come to the Institute as to the relative durability of fabrics," he said. "This difficult problem has been studied from many angles and the solution of it is not yet by any means complete. A new machine has been recently constructed in the textile laboratory in which a combination of abrasion and flexure may be applied to a fabric specimen. It consists of a hard steel blade 3/16 inch thick, the upper edge of which is rounded to as perfect a semi-circle as possible. The specimen of the fabric to be tested is folded over this rounded blade 180 degrees. The blade is given a vertical oscillation of six inches whereby it rubs the surface of the fabric and with each abrasion folds the fabric through 180

degrees. The fabric is in the form of an unraveled strip specimen and is given a tension equal to its weight in ounces per square yard. After abrasion and folding to the number of some thousand times the specimen raveled to one inch in width, is tested for tensile strength. The reduced tensile strength compared to its original value is a measure of the resistance of the fabric to abrasion and flexure."

Chairman Coburn asked for discussion of the subjects brought out by Professor Haven. Kenneth B. Cook, of the U. S. Rubber Company, of Newark, raised the point "as to whether one hour is sufficient time for the average fabric or yarn to regain its full amount of moisture when exposed to standard atmospheric conditions of 65 per cent relative humidity and 70 degrees F. temperature. No doubt some of the more openly constructed fabrics will regain in this time, especially under carefully regulated laboratory conditioning rooms, but it would seem much safer to recommend a longer period of time when testing is to be commercially carried out on a large variety of fabrics where fiber, twist, construction, etc., vary." Mr. Cook pointed out that the American Society of Testing Materials had last year raised from two to three hours the length of time recommended for conditioning skeins of yarns for testing.

Referring to regain, Mr. Cook felt some standard should be settled once and for all. In connection with the importance of a "square" construction for all fabrics which are subjected to a bursting strain, such as tires, hose, diaphragms, etc., Mr. Cook said this could not be too strongly emphasized. "An extensive test carried out in our Newark laboratory some time ago," he said, "on fabrics woven from the same warp, but which had 'off squares' varying all the way from 2.6 per cent to 22.2 per cent, showed that for each decrease of one per cent in the off square of the fabric, the bursting strength was increased approximately three per cent. 'Off-square' is defined as the percentage of warp crimp minus the percentage of filling crimp. In the measurement of crimp it is pretty generally agreed that a tension weight of 75 grams is sufficient to straighten, but not to stretch, a 11/23s ply yarn. On the basis of this, the following formula has been worked out, which is applicable to all sizes of threads:

$$\text{Tension weight in grams equals} = \frac{156 \text{ (Constant)}}{\text{Equivalent single sizes.}}$$

This formula is being used by many, not only in the measurement of crimp, but also as a proper tension to be placed on threads for twist test."

In connection with abrasion and flexure, Mr. Cook said that "we have found there is a great difference in various fibers as regards their ability to withstand flexure. The type of weave, texture, twist, etc., all influence the so-called 'weaving qualities'. Results have shown that rubberized cord fabrics which are woven with about 2½ picks to the inch withstand abrasion and flexure better than square woven fabrics, which have about 23 threads to the inch, both warp and filling, and that web cord fabrics made without any filling threads but solutioned with latex, withstand flexure better than woven cord fabric."

James McDowell, cotton expert of the Sharp Mfg. Company, briefly discussed the subject, declaring that much more than was often realized depended upon the quality of the cotton staple going into the goods.

The second paper presented at the technical session was on the subject:

Fluidity or Viscosity and Sizing Values in Starches, by W. A. Nivling, who said in part:

Not long since, at a convention of textile men, when the subject of viscosity and fluidity of starches was brought up, the chairman found that while many of the men present had been buying starch according to fluidity and viscosity test, they really did not know what these tests stood for. Someone asked the question as to "Why several laboratory tests on samples of starch were not concordant; why one laboratory reported 60 fluidity, another 70, and another 50 on the same sample of starch." The intimate relation of fluidity to good sizing makes the question timely, and an understanding of it vitally important. This is particularly so in view of new and valuable discoveries in methods of modifying starches during their manufacture.

It is only of the physical properties of solutions of the natural or unmodified starches, as related to testing for fluidity and as related to their use in sizing, that so brief an article as the following may treat.

As the terms "fluidity and viscosity" are used somewhat interchangeably to denote one of the service qualities of starch, a brief explanation of these terms and of methods used for measuring them should be of interest to the textile manufacturer. The description which follows is offered for the purpose of clearing up and answering some questions that the textile manufacturer brings up in discussing his sizing problems, either within his own organization or at conventions with others having similar inteersts.

Fluidity expresses rate of flow. As applied to starch solutions used for sizing or finishing, the term fluidity is used as an index or measure of the readiness or freeness with which the so-called starch solution will flow through the pipe to the machine where used. It determines also whether the starch solution will penetrate into the recesses or be merely pasted on the surface. Fluidity is one measure of service quality.

Viscosity denotes the adhesive quality. A solution that is not viscous, is not adhesive. Viscosity may be defined as the reluctance to flow, or the resistance that one particle of liquid meets in flowing past its neighboring particle. It is the clinging property of a liquid, and determines the amount of sizing that will adhere, for it must be understood that a solution may be very concentrated and freely fluid, and yet in the sizing operation will not adhere to yarn in satisfactory amount, unless it is viscous. Viscosity is measured as relative mobility but is more accurately defined as stickiness or gumminess in contra distinction to mere thickness.

Viscosity and fluidity measurement are relative and are compared with the viscosity or fluidity of water. The rate of flow (fluidity) or the adhesive quality (viscosity) is generally measured by one or the other of two types of viscometers.

In one type of viscometer, a comparison is made of the time required for a specified volume of liquid to flow through a tube of small diameter, and the time required is compared with the time required for an equal volume of water of the same temperature to flow through the same instrument. These may be designated as flow type viscometers.

(*Continued on page* 863.)

The Executive and the Power Plant

Some Thoughts on the Need for Closer Cooperation Between the Chief Executive and the Chief Engineer

BY HENRY PUTNAM STILES.

Assuming that the power plant equipment is adapted to meet the requirements if properly operated and cared for, the personnel of the plant becomes of first importance in obtaining cheap and reliable power, light and heat. It is, perhaps, needless to cite instances where good economic results are obtained with equipment much of which practically is obsolete when compared to the latest designs; and on the other hand, instances where the results are decidedly below par with the latest design of equipment. The difference in such cases is found to be due to the personnel, and to cooperation, and lack of cooperation, respectively, between the executive and the manager of the power department.

That greater importance now attaches to the personnel of manufacturing establishments than was throught possible even a few years ago is evidenced by the textile industry, as an example. Probably in no other line of manufacture is more attention given the personnel and the important influence it has on the cost of production and profits. The splendid mill villages, highly sanitary, attractive in appearance and affording the operatives and their children the advantages of cities along the lines of education, homemaking, healthful recreation and culture, offer mute testimony to the fact that the most successful establishments recognize the personnel as one of the chief factors of their success. Since this is true of the establishment as a whole it is true of the several departments of which number the power department is by no means of least importance.

All manufacturers know that the cost of power has an important and direct influence on the cost of production. In nearly every line of manufacture the executive, irrespective of specific title, is familiar with the details in one or more departments. His personal knowledge of the work enables him to keep a mental, if not tabular, check on the efficiency of such departments, and it often happens that these are the most efficient departments in the establishment. It requires an intimate knowledge of details to render any department efficient and to keep it up to the highest level of productiveness. The power department is no exception to the rule. And to keep an effective check on the production and cost of the power deparment requires the same thorough knowledge of details and costs as is required of all other departments.

The most successful executives are not, nor can they be, burdened with details. Such men are principally concerned with the success, from a business point of view, of the establishment as a whole. Their time and energies are properly spent in planning future activities and seeing that present conditions as a whole work toward the realization of such plans. Andrew Carnegie may be cited as an example of a highly efficient executive. He was one of the greatest steel manufacturers in the world. Yet Carnegie knew but little of the details involved in the variety of products of the great Homestead mills. Mr. Carnegie employed men who possessed the knowledge that he (Carnegie) did not possess. Mr. Carnegie planned, and the brains and muscle he bought were used to execute those plans.

The executive of a cotton mill, for instance, rarely is an engineer. Nor is it necessary that he should be. Few men can make important plans and execute minor details at one and the same time. But the executive must know at all times what the effective condition of the whole establishment is, since the present serves as the basis of future activity and development. This principle logically applies to the power department, and since this department represents a complete manufactory in itself, using raw material and delivering a finished product, it should be put on a strictly business basis with a chief engineer as manager. It is the duty of a department manager to deal with details, and by so doing to get the best results that are obtainable from what he has.

Every true executive knows from personal experience that responsibility serves to bring out the best that is in a man. Relieving a person of responsibility serves to stifle initiative and diminish his interest in any undertaking large or small. For this reason the executive who persists in trying to manage his power department not only burdens and handicaps himself with a host of unimportant, time-absorbing matters, but he renders the chief engineer merely a watch-dog of details. There can be no real initiative in the fellow who plays second fiddle. So long as there are no specific complaints results are considered to be satisfactory. No man can rightfully be held responsible for anything in which he has no vested authority.

As the efficiency of any department depends on an intimate knowledge of all details, as well as the results that should be obtained, the chief engineer should be given a freer hand than is often done. He should have complete charge of his department and be held responsible for results. And if he is held responsible for the cost and reliability of power he must be invested with sufficient authority to enable him to execute his plans, in other words, direct all the activities of his department. Wherever a competent engineer is selected, the constant, intelligent attention to operative methods and details produces results that cannot be expected where an executive with limited knowledge of engineering matters devotes a part of his time to a general supervision of power plant activities. In such instances the responsibility for the power department falls on the executive, not on the engineer.

As previously alluded to, the success of the establishment as a whole rests with the executive. It is his duty to investigate systems and methods of manufacture, methods of dealing with and developing the personnel, obtaining raw material and marketing finished products. Systems of generating and distributing power come under this head as one of the factors influencing the establishment as a whole. It is the duty of the manager of the power department to generate and deliver power at the lowest possible cost consistent with the system of power production that is furnished him. For instance, it is not reasonable to expect as low a cost with obsolete boilers, engines and auxiliaries as might readily be obtained with the latest design of turbine, high vacuum condenser and electric transmission. It is for the executive to say whether tubular boilers and

engines are to be replaced by high pressure water-tube boilers and turbines; and it is the duty of the engineer to so run the machinery thus provided as to obtain the highest possible economy and reliability. It requires initiative, and judgment born of experience, to do this. An engineer cannot do what is expected of him unless he is free to exercise his judgment and authority, thus enabling him to put into practice such methods as experience has shown to be best.

It may readily be understood from the foregoing that cooperation between an executive and the chief engineer is highly essential in obtaining the lowest cost of power. On the one hand is a general knowledge of what the power field affords and the costs that may be expected under various known conditions. On the other hand is an intimate and accurate knowledge of what the present plant or system is doing, how it does it and what it may do. Having this information in hand it is not difficult to decide on the advisability of changing the system of power production or distribution. But such an intimate and correct knowledge of power plant operation cannot be obtained by means of grand totals furnished by the accounting department. General averages covering long periods of time are useless for analyzing power plant performance. Without constant analysis it is almost impossible to make a respectable showing in the matter of economy and cheap power. For this reason an executive who does not insist on having detail reports of his power department is at a great disadvantage when any change is suggested or in prospect because it is then a case of comparing the accurate data prepared by outside interests with mere guesswork regarding his own plant. And, of course, an engineer who cannot provide the necessary daily data to permit an accurate check to be obtained at any and all times, is not the kind of engineer who, as a rule, will get the best results out of the machinery he has.

On the other hand, if a capable engineer is employed, lack of cooperation on the part of the executive simply results in paying a good salary to an engineer to tell the executive something he doesn't want to hear. That, of course, shows very bad judgment. If an engineer be given a free hand and produces proper results, his recommendations will be trustworthy, at least insofar as the plant he manages is concerned. Safe judgment pertaining to the requirements of any plant depends on having accurate knowledge of the details of its operation as brought forth by daily performance. This knowledge should be the property of both the engineer and the executive, the latter obtaining it as a means of proper records from which suitable reports are made either daily or weekly depending on the size and importance of the plant. Power plant data to be most serviceable must be reduced to terms that are equally intelligible to the executive and the engineer. This is absolutely necessary in order to permit the discussion of results on common ground.

The chief engineer or power department manager deals directly with pounds of coal and of steam heat units and kilowatt hours or horsepower hours. These quantities must be expressed in terms of the business department, viz., their value in money. The gain or loss found in the power department, when thus expressed, should serve as the executive's check on the efficiency of power plant performance, and such information must be used when determining the efficiency of the establishment as a whole as well as the actual cost of production. As the efficiency of all productive departments is determined on the basis of cost per unit of output, the efficiency of the power plant must be reckoned on the same basis. Furthermore, the same general procedure adopted for determining basic costs for manufacturing departments should include unit costs for power, heat and light. Cost limits are determined by comparison with other establishments of like size and kind. Such comparisons necessarily are made by the executive. When unfavorable, an investigation is made to find the cause, and a remedy applied if possible. It is only by comparison that proper working standards can be adopted and maintained. When comparing power costs under similar conditions, if the result is unfavorable it should be discussed by the executive and the engineer. The former indicates what is lacking and about to what extent. The latter investigates methods and details with a view to lowering the cost. However, in any well-managed plant it is not likely that improvement will be made without certain changes and some expense. It then becomes a matter of judgment as to what changes will be most effective and what the cost will be. It is but natural to conclude that the man who has an accurate knowledge of present performance and present costs will be best fitted to indicate the changes that should be made. That man is the chief engineer, whether or not he is known by that particular title. When an executive fears to trust his chief engineer in such matters it may be accepted as a reliable indication that the relation between executive and engineer has not been favorable to getting the best results, viz., to obtaining the lowest operating cost.

Nothing serves to stimulate a person to put forth his best efforts more than does an expression of confidence. This is applicable to all kinds of work and to all positions, high or low. When an engineer has done good work, his suggestions should be accepted at face value and put into practice wherever practicable. Nothing destroys initiative and genuine interest in one's work more than the introduction of opinions and the adoption of suggestions of outsiders, especially of disinterested parties. Such tactics will demoralize the personnel of any department.

The term executive implies the general supervision of important matters. The carrying of details naturally handicaps one in the discharge of important duties. Our best executives are those who relieve themselves of minor cares by employing specialists to care for the details and making those specialists responsible for results. Our best chief engineers assign minor details to those capable of caring for them, making each person responsible for that part of the work assigned to him. The most advantageous relation between executive and chief engineer represents a judicious division of responsibility between them, so that each will be best fitted to serve the interests of the establishment as a whole.

Newport Chemical Works, Inc., Passaic, N. J., has announced the production of a new product by the name of Newport Steel Blue LGN, which, it is stated, has good fastness to washing and fair fastness to light and weather. It is designed as a useful color for steel blue shades on union material of cotton or wool, also useful for mode shades on pure and artificial silks.

Texas Textile Men Meet at Waxahachie

Meet the Texas crowd!

They're a fine bunch of fellows, and good mill men, too. A reading of the report of their discussion on mill subjects, contained in this story, will demonstrate that.

The Texas Textile Association, at its annual convention held at Waxahachie, Texas, on Friday and Saturday, May 9th and 10th, brought together representatives of every mill in the state except one or two. It was altogether a profitable and enjoyable occasion.

This reporter's attendance at the meeting comprised his first trip to Texas, and the industry there, speaking from a textile standpoint, had always seemed as something far removed from his accustomed haunts among the red clay of Georgia and the Piedmont plateau of the Carolinas. But his disillusion was as complete as it was satisfying and sudden.

Texas has founded the nucleus for her expected textile manufacturing development upon a substantial basis. A vital pillar in the supporting structure will be the conventions of her operating executives, which are already emphasizing the practical discussion idea. Texas readily accepted the creation of her sister organization, and is utilizing it to profitable advantage.

But that's digressing—even if upon a good thought. This is a report of the Waxahachie meeting, not an editorial, nor even a volume of memoirs. To continue—

The delegates began arriving in Waxahachie around noon, and before dinner, inspected the plant of the Waxahachie Cotton Mills, whose superintendent, W. H. Gibson, with an efficient corps of assistants, did everything to make the stay of the visitors enjoyable.

At 6:30 o'clock—and promptly, by the way—the men were served a splendid meal in one of the rooms of the mill, from which the machinery had been removed. Original plans were for having the dinner at the city park, but chilly weather prevented this, and so the space at the mill was utilized. The meal was prepared and served by the ladies of the Home Economics Club of the Waxahachie Cotton Mills. President C. S. Tatum, superintendent of the Bonham Division of the Consolidated Textile Corporation, Bonham, Texas, was toastmaster. Mayor Johnson, of Waxahachie happily welcomed the vistors, in whose behalf W. S. Morton, superintendent of the Dallas Cotton Mills, responded graciously in a talk much appreciated by the men.

After the dinner at the mill, the men repaired to the Rotary room of the Rogers Hotel, where the first discussion session of the convention was conducted. Preliminary to the round table discussion, President Tatum called upon Robert W. Philip, associate editor of COTTON, who spoke on "The Development of Practical Discussion in, and Its Value to, the Textile Industry."

Advantages of Having Free Discussion.

"We were in a meeting in Atlanta some eight months ago," said Mr. Philip, "and the superintendent of one of the South's largest and best known mills was speaking. 'At our mill,' he said, 'we have for years made our size and cooked it under pressure. For a number of years our agent would not permit us to let anybody know about it—starch men and size men and everybody else were never permitted to see that operation. After a while, we discovered that we didn't have such a secret as we thought we had, and just as soon as we became willing to allow men from other mills to see how *we* did it, they would tell us how *they* did it. The result is that we have now changed our system and materials so that we have a saving of about 80 cents per hundred pounds of starch—which in our case amounts to quite a bit of money.'

"This man, without knowing it perhaps, illustrated precisely the purpose of the discussion meetings of mill men," continued Mr. Philip. He then outlined the development of the discussion meeting plan among the mills of the Southeast, saying in part:

"Some of you men are familiar with the Southern Textile Association, and have attended some of its meetings. The Association has been in existence for quite a number of years, holding its regular semi-annual meetings. Unfortunately—and this is said without reflection upon any-

one with the real interest of the Association at heart—the meetings seemed to experience a sort of degeneration. I use that word relatively, for it is an axiom that unless a man, an organization, or anything else human, does not progress in the sense of the word as we use it, it cannot stand still, but goes backward—and the Association meetings seemed to become pretty much of the same thing each time; with the perfectly natural result that the fundamental purposes were subordinated for the time while the lighter side of the mingling together was emphasized.

"That is not said to present a dismal picture of absolute failure. The meetings were splendid, for they provided that feature which should never be lost sight of: the opportunity of 'mixing' and rubbing shoulders among both the mill men and machinery and supply representatives. But something seemed to be lacking.

"Some five or six years ago, an earnest effort was made by those in charge of the Association—ambitious men they were—to ascertain just what this 'something' was, and to supply it. As a result of their discussions, it was determined that the textile industry of the South seemed lacking in definite standards of operating methods. It was felt if the practice of the majority could be ascertained, the man in charge of a mill would have some basis to work up from, or toward. Furthermore, it was realized that as the meetings were then conducted, the thoughts brought out in the meetings were only those of a few men, who had been asked to prepare papers, whereas every man in the hall, doubtless, had opinions or information on some specific subject that would be valuable to others if it could be brought out.

Dan H. Poole, superintendent, Sherman Manufacturing Co., Sherman, Texas, re-elected Secretary-Treasurer.

"Following up the first thought, a questionnaire embodying questions upon a number of high points in cotton manufacturing was circulated among the mills of the South, with a response, which, while not in itself satisfactory, indicated to the officials an interest that might be developed.

"Therefore, in December, 1920, the second part of the plan was promulgated. A call was issued for a meeting in Charlotte for the discussion of card room problems. That was all. Curiosity, interest, and maybe habit, brought together a crowd of some hundred and fifty men for what I shall always consider a milestone, and a very important milestone, in the progress of the southern textile industry.

"The meeting was an unqualified success. There were no dramatics about it—just a big bunch of cotton mill superintendents and overseers come together to 'talk shop.' Nor shall I attempt any pyrotechnics of speech in telling you of it. It was the beginning of a revolutionary practice, the establishment of a plan that has thrived and grown and that has resulted in immeasurable value to those participating.

"Encouraged by the results of the Charlotte meeting, the officers announced a spinners' meeting, which was followed by a weavers' meeting—all equally successful and helpful. Then the men said they didn't finish up at the first carders' meeting so they had another one, and then another spinners' meeting, and so on, until these divisional meetings have become a sort of institution in the life of the textile man of that section. More and more each meeting the men are recognizing the value of these gatherings, and each discussion brings in new faces to augment those of the men who initiated the movement.

"I have gone into detail that may seem unnecessary in order to present the background of the organization that is operating so effectively for the mills of our section. The end is not yet, nor have the leaders ceased to plan and envision still greater things. Among the projected works of the Association is the establishment of what is to be called a Textile Foundation, which, by the way, has received the approval of the financial executive association, in view of the helpful results of the discussion meetings. The ultimate purpose of this plan is the establishment of a technical organization, which, provided with a laboratory under scientific supervision, shall endeavor to establish standards on the various questions concerning which the divisional meetings have developed a wide difference of opinion. It will have an experienced millman at its head, with several assistants, who will be at the service of the mills contributing to the organization. These men will conduct research work, compile textile information, make tests under proper conditions, and supply plans for tests to the superintendents and overseers.

"Adverse business conditions have hindered the crystallization of these plans into definite form, but means are under way for the financing of the project, and the leaders in the organization hope for an early start in its establishment.

"Now a word about the meetings: It isn't so much the actual, specific information brought out in these discussions, when considered in the light of their applicability to your plant, that counts. Conditions at different mills alter lay-outs, local arrangements and facilities determine the course of action. I might say, on the other hand, however, that frequently men report tremendous savings in their mill by the adoption of the ideas developed in the discussions.

"The most valuable result of the discussion as viewed by the most interested observers, is that it puts the men to *Thinking* and sends them home influenced to find out what they really are doing. Men in business, men in industry, all too easily get accustomed to treading familiar

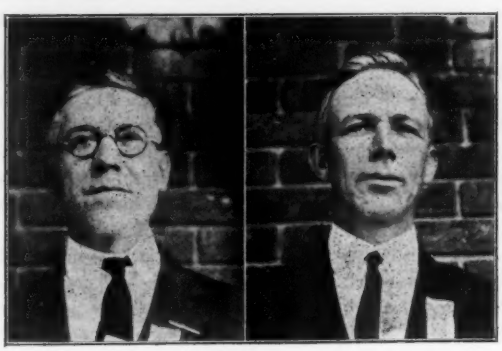
paths which in time wear down, until frequently they find themselves in a surprisingly deep rut and it is sometimes a difficult matter for them even to see over the sides. It is only when we bump into a totally dissimilar practice and find it giving improved results that we discover that we are in a footpath we have worn through constant usage.

"It is in changing the route of travel, in directing mental footsteps into fresh channels of thought, in moving

At the left: C. S. Tatum, superintendent, Bonham Division, Consolidated Textile Corporation, Bonham, Texas. The retiring President. At the right: W. H. Gibson, superintendent, Waxahachie Cotton Mills, Chairman Entertainment Committee, and elected President succeeding Mr. Tatum.

the men to investigations of their own work, machines and processes that such interchanging of ideas sows the germ-seeds that may be later reaped in terms of increased efficiency on the part of the individual, by personal application to personal problems.

"To look up, not down; to look forward and not backward; to look out and not in; and to lend a hand!



J. O. Wilson, superintendent, Guadalupe Valley Cotton Mills, Cuero, on the left, who was elected First Vice-President, succeeding J. R. Compton, superintendent, Gonzales Cotton Mill Co., Gonzales, the retiring First Vice-President, at the right.

"And the valuable feature of the proposition is that these meetings hold something, not alone for the man who obviously is having difficulties, but as well for the man who is knocking every production record out, whose costs are down in a deep well, and whose mill is running like a top. The final stage of improvement is never reached in man, process or machine. You men know better than I do how often, by diligent application, thought, and experiment, you have been able to improve upon what previously seemed to be about the best there was. And so it goes. The Tallassee Mills have a motto in their house organ that aptly expresses the thought—'One work forever remains—that of surpassing all that has been done.'

"We must not abuse our minds into believing that our particular mill represents a separate, distinct and self-contained entity. It is in reality a link in a big chain, and as every link in a chain has a very definite part to play in whatever performance to which the chain might be put, so must every mill lend its every ability to the upbuilding, strengthening and maintaining of a progressive, forward-looking, prosperous industry.

"You men here are the keymen of the industry. The actual responsibility of operating the mills, of producing a maximum of first quality product at a minimum cost, rests upon your shoulders. You did not learn what you know alone, neither will you progress further than the point where you now are by dint of your own self alone. The oftspoken axiom that civilization is bound together by ties of interdependence has no more striking an application than in the textile industry, and among you men particularly. Ideas are the most valuable commodity in any industry. Propagate, disseminate, scatter and culti-

Grover C. Dilling, superintendent, Brazos Valley Cotton Mills, West, Texas, at the left, who was elected Second Vice-President, succeeding S. C. Cain, superintendent, San Antonio Cotton Mills, San Antonio, retiring Second Vice-President, at the right.

vate ideas—you contribute immeasurably to the welfare of yourself and that of the other fellow. Segregate, attempt to produce them as hothouse plants—the result is a withering stagnation.

"And after all, we are all in the same boat as the superintendent I referred to in the beginning—everything to gain. Gordon Cobb put it this way: You have a dollar and I have a dollar; we swap. Each has a dollar. *But* you have an idea and I have an idea and we swap—and each has *two* ideas. Expand that in proportion to the number of men assembled and you have an idea of the interest paid on an investment in such a meeting.

"I wind up this rambling talk with a word about Service—which, after all, is what all this resolves itself into: Service to yourself, service to your employer, service to your fellow workmen in this great game. Service is the keynote of industry, the great business of life is service—may each of us find how, in our own spheres of activity, with our particular knowledge and information, we can impart that which will in some way contribute to the industry from which we derive so much."

Following Mr. Philip's remarks, the president directed

the meeting immediately into the discussion of some of the questions embodied in the questionnaire previously sent to the superintendents for written answer. "Over 95 per cent of the men answered this questionnaire," said Mr. Tatum, "which is very encouraging and gives us a very good idea of the composite opinion and practice of the superintendents." Beginning the discussion, he said, "There is one question that is important, and that is the problem of getting the raw material properly mixed. There is a great deal of difference in two bales of middling cotton, or strict middling or strict low middling, and especially when the grades are mixed together—there is quite a difference in the spinning values of these cottons.

"It goes without saying that we get better work if we have the mixing uniform. I realize that most of us do not have enough room to mix our cotton as we should; we are limited in our opening rooms. But I myself have wondered which is better—to open up all the bales all over the room, or would it be better to take a smaller number of bales and mix them all in one pile. I notice in the answers that half of the men voted for mixing in a pile and the other half say they favor using it in rotation off the tops of bales." Mr. Tatum called upon Hugh S. Clarke, vice-president and superintndent of the Miller Cotton Mills, Waco, who had made some conclusive tests in regard to mixings.

"I am very much interested in mixing," responded Mr. Clarke. "After talking to various cotton mill men I saw there was quite a difference of opinion, and I decided to try for myself some tests which would help me to decide which was best. In my own mind I had an idea it would be better to open up as much as possible and put it in a big pile and then feed it into the opener so as nearly as possible to get a little bit of each bale on the apron at one time.

"In order to tell whether I was right or wrong, I got together four different bales of cotton, each of a different color (our cotton being dyed in the raw stock gave me an excellent advantage in making the test). I placed a big armful of each on the apron and let it run on through into a lap off of the finisher lapper—by the way, we have a Kirschner beater in the finisher and a two-section breaker. I then made a lap by taking four other bales of different colors and took a layer off each and mixed it all into a big pile by hand. I then put this mixture on the apron and made a finisher lap, and there was a very great difference—the last lap I made had almost a uniform color; the first lap was very mottled with big chunks of one color coming through at a time. Then I took these two laps and put them through the cards and when I got them through it was still plain to see that the last method was the best from the standpoint of giving a thorough mixing." Mr. Clark added that the differently colored cotton provided an advantage in demonstrating the mixing properties of the two methods, but pointed out that what would apply to the colors would also apply in different grades and staples of white cotton in securing a uniform blend.

"I think that is pretty conclusive evidence that we get a more homogeneous (is that a good word, Professor Bagley?) mixture when we mix them all in one pile," commented the president. "Mr. Gibson, I noticed that you do not do it that way at your mill; you feed off of the top of bales in rotation. Tell us why."

"I really prefer mixing the cotton in pile," answered W. H. Gibson, superintendent of the Waxahachie Cotton Mills, "but on account of lack of space in the opener room, and picker room, we have only been able to feed off of one bale at a time. Cotton is just like men—You have different characters and characteristics in the different bales. We are going to make some changes for mixing our cotton better and for working our waste, but at present we are crowded for space."

It would cost a little bit more to feed off of a big pile, answered Mr. Gibson to a question from the chair "but it would not require over one more man. I believe with the vertical opener, and distributing system, which we are now about to install in the picker room, and then changing the breaker lap, will give us a better mixing. If you mix the breaker laps up behind the intermediates or finishers it will give much better results."

"I never had thought much about mixing the breaker laps," said Mr. Tatum, "but that's a mighty good point. If you have fifteen or twenty breaker laps and mix them behind the intermediates or finishers, you do not have the same cotton going on through; you get cotton off of more different bales in your finisher laps if you do not run the laps from certain breakers into certain intermediates all the time. I think we doubtless are overlooking there a possibility of a greater mixing that doesn't cost any more." He then called on I. G. Moore, superintendent, Brenham Cotton Mills, who said that he had had experience on one side of the question only. "We mix it in a large pile; we happen to be fixed up in our opening room so that we have plenty of space so we can mix eighteen bales at a time," he said, "our usual mix being twelve bales in a mix. I never tried mixing off of the top of bales, but this other way appealed to me so that I have followed it out as I found it when Mr. Tatum left.

"As to the extra labor," continued Mr. Moore, "that will amount to very little. We used to use two men in our opening room, but now we have it so that we can mix as high as 70 or 80 bales with one man, who also feeds the opener. That is our usual week's run, and I don't know how much more the man could do if we had to do it, this being as much as is necessary in a week's time. My experience has all been on one side, and I have never seen where it would be worth while to change."

"Well, how in the world do you get that one man to do that work on which you formerly used two men?" Mr. Moore was asked by the chairman. "Well, we just 'bear down on him'," was the reply. "If you bear down hard enough you can get lots of things done if you have to."

"I wonder if the war's being over had anything to do with the difference in the 'bearing down'," mused Mr. Tatum. "You know, we used to blame many things 'on the war'. Mr. Braley, you have had experience with both methods, give us your opinion."

"I prefer mixing in a pile, as we do it," responded Joe Braley, overseer of spinning at Itasca Cotton Mills. "We open 22 to 24 bales at a time. We spread it out in a circle around the room and take one bale and distribute it out as thin as possible. We first put down the best grade we have, and the worst one next to it, alternating the grades that way all the way through the pile. We find that this blends the colors—the off colors—it blends

the staple, we get a better breaking strength, and more uniform numbers, than any other way."

"At the time you changed did you change anything else that might have helped you?" asked Mr. Tatum. "Not a thing!" was the reply.

J. O. Wilson, superintendent, Guadalupe Valley Cotton Mills, Cuero, next spoke. "We mix ours just by feeding it off of each bale separately, on account of our crowded condition we haven't got enough room to mix the other way. But I really believe the 'pile' method is best."

"Yes," observed Chairman Tatum, "I suspect we would all do it the other way if we had room for it."

"I run the warehouse at the Dallas Textile Mills," said Mr. Brinkley, "and we have there bins that hold twelve bales of cotton. We run our cotton in grades—2s, 3s, 4s, etc., as we call them, on down to 6s. The 6s is the lowest, about a bright bolly, our 5s is a little lighter, 4s a low middling, 3s a middling, and the 2s and 1s are our best grades. When putting up our best mix we use the 3s, 2s and 1s. We spread these bales down and take four rolls about a foot thick off of each bale and then we put a layer of the other bale and so on until we get a layer of each bale in the mix. Then we put a layer of our waste into that mix, and then we turn around and put it right back on the same mix again, two 2s, two 1s, and two 3s; we call that a lay-down. We carry 12 bales in that lay-down, and I find it keeps it regular. Then when we feed off that mix we do not reach up and take it off, we get it right square down all the way clear through to the floor. I do our loose cotton (samples) the same way. We spread that out on the floor and pick the stains and bolls out of it and mix it in the same manner."

"How many men do you use in your opener room?" asked the chairman. "Two on the machines, and then four or five on the mixing," was the reply. "When we use a lot of loose cotton I have to have five men, but on straight cotton I shouldn't use over four on the mixing. I could get along with three, but we have to do the weighing in the meantime, and a lot of other work."

"You think you are well repaid?" "Yes, sir, I do," said Mr. Brinkley.

Grover C. Dilling, superintendent, Brazos Valley Cotton Mills, West, next said, "At the present time we open 12 bales and feed from the top of each bale. I prefer mixing in a pile, however, and would do it if I had the room. If we could open about 20 bales at a time and do it this way I am sure we would get better results."

As everyone who spoke seemed to be a proponent of the "mix it in a big pile" method, Mr. Tatum said he "would have to make a little confession." "I started a system of mixing it in one big pile when I was at Brenham," he said, "but when I went to Bonham I had a lot smaller space. I decided, just by theorizing, that I would get better results if, instead of mixing 12 bales in that way, I were to open 30 bales and feed in rotation and feed just a small amount at one time into the hopper. I theorized that by the time you got to the drawing, you would have just as thorough a mixing as you would mixing it in a pile, and you would have five or six times as many different bales of cotton represented in the sliver, because when you feed off of an opening of 12 bales, that 12 bales goes clear through to the drawing, usually, before you get any more cotton mixed in with it. There is a serious doubt in my mind as to whether or not this business of mixing in a pile is the wiser. We have started a test through the other way and are going to try to find out for ourselves. I think all of you will agree with me that the drawing sliver will have a great many more different bales represented in mixing off of 30 bales in rotation rather than by putting 12 bales into a pile and running it through. Of course if I had room I would mix 30 bales in a pile; that would be better."

"The majority of us seem to be of about the same opinion," observed Mr. Gibson, of Waxahachie. "It seems to me that Mr. Clark's test with the colored cotton was pretty good evidence that the pile method is satisfactory. However, all of you were out at our mill this afternoon and saw our spinning, and we feed off of each bale in rotation, and if any of you have any better running spinning than ours, I surely would like to see it."

"What's your front roll speed?" asked Mr. Tatum.

E. L. Sord, overseer of spinning at Waxahachie, answered that on some of their spinning, the older frames, they run 145 r.p.m., and on the newer machines run 148 r.p.m. This is on 6s and 8s.

Mr. Clark called attention to the fact that the discussion seemed to have divided the subject into two questions—that it was a question of whether a thorough mixing is worth while to me. I have determined in my own mind which method is better, and I want to know now just what particular benefits I derive from a thorough mixing."

In answer to Mr. Clark, Dan H. Poole, secretary of the association, and superintendent of the Sherman Cotton Mills at Sherman, said, "I think Mr. Braley about expressed what I am going to say: that the benefits derived from the proper mixing of cotton include the blending of the colors, grades and staple, uniformity in weights. That is our experience. There is also less variation. I observed that immediately after changing methods—this was with the same cotton, same machinery, same conditions and speeds, same everything."

"I do not mix in a pile," said S. C. Cain, superintendent of the San Antonio Cotton Mills, "but that is the proper way to do it. I'll tell you what I know to be true: I was in one mill where we used, I think it was, 80 bales a week, on hosiery yarns—and what will help on hosiery yarns will also help in weaving. We mixed a week's run at a time in one pile; we had room enough to do it. The work ran much better and we could clean it much better; the cotton seemed to mature so much more readily, and we got stronger yarn. If I could do it at my present plant I am sure it would help my work at least fifty per cent."

"I wonder if any of you have made any tests,—or have observed it—whether or not when you mix it in one big pile, the cotton is more susceptible to change in humidity, or a variation in weather conditions. That is a big problem in controlling weights. When the weather is rainy it is wet in the opener room, and when it is dry outside it is dry inside, and the cotton will dry out more in dry weather and absorb more moisture in rainy weather. Has anybody any opinions?"

Mr. Brinkley, of Dallas, said that he had noticed sometimes, when having cotton laid up ready for about a week, that he could notice a difference in the way the cotton fed through the conveyor pipe into the picker room. "I know about how long it takes it to use up the 12 bales out of a bin in ordinary condition, and when it lies for a week it runs through better, if it is dry weather. In wet weath-

er it is harder to handle. We have no humidity in the picker room, and in the mixing room the doors and windows stand open in good weather and in damp weather we have them shut. In wet weather it seems like it gets heavier and it takes longer to run it, the machines will choke down, but in dry weather it seems like it is not a bit of trouble to get it out of the way. I think, however, it is better to have it laid up for not over two or three days rather than to have a week's run at a time ahead. It drys out just like green cotton." Mr. Brinkley added that they reweigh every bale of cotton that comes to the mill and that provides him with a very useful check on the cotton going in.

President Tatum called upon J. H. Merritt, superintendent, Dallas Textile Mills, for a statement on mixing cotton. "Well," said Mr. Merritt, "you men know that an eggnog is ancient history. In making one you wouldn't put the spirits in one glass, the egg in another and the milk in another, and drink them separately—you would mix them up together good. The same principle applies to mixing cotton. A good mixing gives uniformity in weights and blend and makes better running work."

The chairman passed on to the next question at this point, which concerned methods of mixing waste back into the regular stock. "That is a thing we can all improve on," he said, "and I am going to ask Herbert Burow, overseer of carding at Bonham, to tell you how he mixes his waste into his regular stock for the sheetings and also in his waste duck product."

"We run back the white waste off the cards and drawing and roving frames," responded Mr. Burow. "The roving frame waste we run through a waste machine to open it up. This is fed into our regular stock. Our method is to use on one day the waste made on the preceding day and we feed it so as to make it last all day. Card strips, motes, spinning frame roving waste, is worked into the duck stock. This we run through a waste machine—by the way, we re-work all of our motes out of the vertical openers and pickers—and clean them and then run them through with a very low grade of cotton or dark bolly cotton, probably one-third cotton and two-thirds motes. We put it through the breakers and intermediates and then card it, and bring it back into the picker room and mix it with card strips, etc., and make a lap. This we mix on the intermediates with the duck laps, running two duck laps and two waste laps at a time. In that way we get a fairly good mixing of our waste. We have just started working our motes back by carding them once and then working them by and carding with the duck stock and we are having quite a success with it so far. I believe we are making more money by re-working our motes in that way than by going ahead and selling them for a little or nothing at all."

In describing the waste machine, Mr. Tatum added that "the motes are put through a carding waste machine and then through a two-section spiked roll roving machine—which most of you have—before they are put into the breakers. When he said these mote laps were mixed with the duck cotton he meant that they were mixed with two of our 5s, two 4s and two 6s—half the mixing consists of that cotton and the other half of waste. It is mixed equally on the intermediate aprons."

Joe Moak, overseer of carding at the Texas Cotton Mill Company, McKinney, Texas, said that "there are several kinds of waste we have that we cannot use back into our white stock, and that is all dyed into the colored work and used in the black." They make pin checks, he said, and the different colors are kept separate through the cards, drawing and slubbers, and the waste is kept separate. "The roving waste is run through the waste machine and then when we mix it we take it back to the opener room and put it in with our regular run of colors. By doing that we find we can use lots of our waste and use it in a profitable way and it doesn't make any difference in the work. Our white strippings, roving waste, etc., I run through the waste machine and then we take those laps and put them on with three cotton laps. We make our waste one-fourth in our card laps and these laps are run through on certain cards and run in one-and-three. That gives us a uniform mix of waste all the way through. In that way we keep the same proportion of waste coming through all the time. Sometimes when we are short of card strips we get the lowest grade cotton we can and run it in the place of the waste; if we haven't got enough waste we use a low grade bolly cotton. We pick out the white cotton, we do not run sweeps, etc."

Mr. Moak said he noticed Mr. Tatum said that at Bonham they run the motes through the pickers and make a breaker lap of them and asked whether they found it necessary to put something in with them to hold the stuff together. "We do mix some bolly cotton," replied Mr. Tatum, "but we find it better to run half bolly cotton and half motes. We have been on that double carding system about two weeks and believe it is going to work out fine." He added they had no difficulty in putting the motes through the pickers. Mr. Moak stated that he could never get it to hold together. "We are saving about $25.00 a week doing it that way," continued Mr. Tatum, "and while that doesn't look very big by itself, if you can save $25.00 in enough places it soon mounts up."

Mr. Gibson suggested that they turn the discussion into a consideration of how to eliminate waste. "We have to have waste," he agreed, "but a lot of us put too much time and thought on how to take care of it rather than putting it on how to fight waste. That is the system we are going to work up to at our mill."

"Have you ever made a test by weighing a certain amount of cotton and a certain amount of strips and carry that through the laps and find out how much strips you have when you get to the finisher?" suggested Mr. Braley. He said one would be surprised at the amount. He suggested that the test be made by Mr. Tatum, through his vertical openers in double tandem, declaring that "I think you will find a great deal of the strips right there." We do not put the strips through the vertical opener," explained Mr. Tatum.

"I should like to have Mr. Gibson give us his ideas of how best to prevent waste," requested Mr. Merritt. "Well, I think the best way is just 'to bear down on 'em' like Mr. Moore said," replied the gentleman from Waxahachie. "Weigh your waste and see how much is going back. You will be surprised to see how much really is going back."

In response to a question from the chair, it seemed that nine of the mills represented at the meeting weigh their waste at each process. Mr. Sords, of Waxahachie, explained their system—which is for each overseer to

weigh the waste at each process, make a record of it and report it to Mr. Gibson, who gives back a compiled report to the overseers each Thursday night.

In connection with this subject, Mr. Tatum said that "I have a hobby of putting the blame on the individual responsible, wherever possible. We keep a record of the waste not only at each process, but at each machine, and we have a check on how much each operative is making. A weekly report is made out and posted, and that helps us lots in keeping the waste down. As long as you shoot at the bunch you can talk your heads off without getting much results. You must find out the guilty bird and aim at him, and not at the whole covey. We have just started a system of keeping track of the warper waste and laps that each warper tender makes and we find that we cut the number of laps at the slasher in half. Whenever you can put your finger on the individual responsible for the damage you are a long ways toward eliminating the difficulty."

"Speaking of 'bearing down on 'em'," said Mr. Poole, there is such a thing as carrying that to an extreme, in endeavoring to reduce waste. Did you ever look at the outside corners of the mill fence, or in the homes, for the waste? I have found it in the houses of some of them."

"It might be interesting to know the reports of the men on the amount of net loss between the cotton and the baled cloth," said Mr. Tatum, who read the percentages of some of the men as follows: 5 per cent; 5 per cent; 6 per cent; 6.5 per cent; 7 per cent; 8 per cent; 8 per cent; 10 per cent; 10 per cent; 11 per cent; 11 per cent; 12 per cent; 15 per cent; 20 per cent. "Some of these folks must have made a mistake; I don't believe anybody has a net loss of 20 per cent," declared the chairman. In going into this matter, it seemed the explanation for the wide variance seemed to be in difference in inventory systems, or in the weight and type of product manufactured, and other contributing causes. However, said the chairman, "it seems that we have got a big opportunity to improve on methods of taking inventory, or of handling our waste, or both. Some of us ought to do a lot of 'bearing down.' I do not think surely there is the difference shown in these answers. Most of them are on practically the same numbers and very much the same lines of goods. Consider what that five per cent of your total product means in dollars and cents. It is several times your salary. Some of us are mighty careless in looking after waste, or else in our figuring."

Sidney J. Files, assistant manager at the Itasca Cotton Mfg. Co., who reported a reduction of three per cent in his net waste, attributed the saving to a modern humidifying system installed at his plant. "There is no doubt but that an adequate system of humidification makes a great deal of difference," commented the chairman.

Ball bearings on picker aprons and eveners was the next subject presented by the chairman for discussion. Called upon for a statement, and summing up his experience with this application, William Gillis, overseer of carding and spinning at the Planters & Merchants Mill, New Braunfels, said, "I get an evener lap. There is no lost motion and the lap doesn't pull hard." Chairman Tatum asked Mr. Gillis if he had to choose between ball bearings on the apron and ball bearings on the evener, which he would prefer, and Mr. Gillis said that of the two applications he would rather have the ball bearings on the apron. In response to a question from Mr. Poole, he said his laps were evener both in the total yardage and in yard-by-yard measurements after the ball bearings were installed on the apron and evener. Mr. Clark reported satisfactory use of ball bearings on beater shafts.

In the questionnaire the question of the old fancy stripping roll was listed, and in reporting on this the chairman said that it seemed this equipment, "didn't have a friend in the bunch."

"I saw some piled up in a bunch the other day," commented Mr. Braley. "We've got some for sale," added Mr. Tatum.

The Texas mills vary in the time of scouring drawing rolls from some which scour once a week to others that do it once every four weeks, Mr. Tatum reported from the answers to the questionnaire. The majority seem to scour every two weeks, he added.

Methods of training new help were next discussed, and Mr. Moore, of Brenham, started it by saying that "I heard in a roundabout way of a method by which they train help at the mill at New Braunfels, and if their representative would be willing to do so, I should be very much interested in having it explained."

Mr. Gillis, of New Braunfels, said in the weaving department, particularly, special instruction was necessary inasmuch as the type of goods manufactured was somewhat new to the help in that section. He stated that they put a loom in a warehouse in charge of a good weaver who had the ability to impart his information to the learners, and that they sent a bunch of help out of the weave room for two or three hours instruction a day after which they returned to their work.

Mr. Tatum asked whether, after turning a "green" hand over to an operative to train, the overseers and superintendents gave them any subsequent personal attention to see how the new workers got along. He called on Mr. Merritt.

"I suspect we are all in the habit of trusting to the Lord," said Mr. Merritt. "After they are trained we put them with an experienced operative and try to impress upon them what their duties are and what they are expected to accomplish. While they are in training we pay them a nominal sum and then after two weeks experience we put them on two or three or four sides and then the overseer gives them his personal attention."

"How long should it take a green operative to become proficient enough in spinning to operate six sides?" asked Professor J. B. Bagley, of the textile department of the Texas A. & E. College. One man said it would take over a year. Mr. Clark said he had been giving the matter his personal attention and had found that it takes about a year to make a good spinner, on the average. In certain instances, however, he has found unusually adept workers to "catch on" in a much shorter time.

Mr. Cain, of San Antonio, next expressed his opinion, which was of peculiar interest inasmuch as the operatives at his mill are for the large part Mexicans. He said that it depends to a very great extent upon the desire on the part of the individual worker to learn, and also on his aptitude for the work. He said he has some Mexicans that have been with him for ten months or a year "who can spin as good as anybody's help." He added that the

time it takes operatives to become proficient depends to a large extent also upon the numbers run in the mill.

Mr. Merritt suggested that his overseer of spinning, S. L. Bolton, express his opinion on the matter. Mr. Bolton said that though the mill has been in operation only about three months, he has some learners who are running from four to six sides—these girls, he said, had never seen inside of a mill before. "We usually keep them about two weeks with a good spinner and caution that spinner to teach them right and to teach them especially about cleaning, and then I go around every day and see how they are getting along—whether they are putting the ends up right, whether they are tangling the bobbin, or making big gouts, and in about two weeks I put them on two or four sides. After you do that and keep them on for a half a day you can tell whether you have a spinner or not. It takes about six months to teach an average girl to run six sides." His average number is 14s, Mr. Bolton said in response to a question.

Mr. Sords said he agrees with Mr. Cain—that "it depends on whether they want to learn or not. Another man said he has some who learned in four weeks, and has others who have been with him four years and don't know very much more about it than when they started.

In answer to a question, it developed that operatives coming from cotton mill families acquire proficiency much more readily than do the help from the country or those whose families were in other lines of work.

"I heard one spinner say it took about three months to 'tame' them when he got them off the farm," said Mr. Tatum.

"What are the principal causes of bad selvages in duck?" the chairman next asked. "You know, the average buyer or user of cotton cloth doesn't know very much about the finer points of spinning and weaving, but most of them can detect a bad selvage right away." J. R. Compton, who used to be overseer of weaving for Mr. Tatum at Bonham, but who now is superintendent of the Gonzales Cotton Mill Company, was asked for his opinion.

"The worst thing I think in duck is a saw-tooth selvage," responded Mr. Compton. "I think the principal cause of this is friction in the shuttle. That can be caused from the filling being too large and sometimes from the way the harness is set."

"Just how would the setting of the harness make bad selvages?" asked Mr. Tatum. "If they are set so they close up too quickly, before the friction of the shuttle pulls all the slack out of the filling, it will leave a soft selvage," said Mr. Compton. "You can have the harness cams closing too quickly so the friction will not pull it up rapidly enough."

"Do you think twist in the filling will affect it?" was Mr. Tatum's next question. "Yes," replied Mr. Compton, Twist will make it kink. The more twist, the more friction you must have on it."

Mr. Wilson, of Cuero, was asked for an opinion. "I find that setting the harness has quite a bit to do with the selvage," he said. "I find in going around through different weave rooms—and in my own weave room when I used to run one, that the way I had my harness set, having the harness pick off the front harness from the right hand side will pull on the top shed, while if it is picking off the back harness from the right hand side it will pull on the tight end."

J. V. Hunt, overseer weaving, West, Texas, said that a principal cause of bad selvages is a lack of uniform setting of the harness. "Bad piecing in the spinning room will also make bad selvages in the cloth," added Mr. Wilson.

At this point the session was brought to a close, due to the lateness of the hour, and the chairman announced that the discussion would be resumed at the Saturday morning session.

The Saturday Morning Session

was held in the assembly hall of the attractive Waxahachie Library, and was called to order at 9:30 o'clock by President Tatum. This session was given over to a continuation of the discussion, and the first question brought up for discussion was the life of electric lamps or bulbs. Mr. Tatum pointed out that while this seems a rather negligible item, at the same time it is an important feature in the long run, and that too few mills give consideration to the subject of lengthening the life of the lamps used in the mill. He presented, to discuss this matter, Mr. Robertson, of the Dallas office of the Westinghouse Lamp Company.

Mr. Robertson's talk was very instructive, and he presented much food for thought on the part of the mill men. The electric lamp life, he began, is contingent upon the temperature of the filament. In the average Type B lamp the filament burns at a temperature of 2,400 degrees, that is, the lamp with the long, straight filament. The concentrated filament lamps are known as Type C, and they operate at a higher temperature. The estimated life of a Type B lamp is a thousand hours without undue vibration. The Type C lamp burns at 2,700 degrees temperature with the result that the filament is whiter. The filament melts at a temperature of 3,100 in a vacuum so a very important item in lamp life is voltage regulation.

In connection with voltage regulation, Mr. Robertson stated that he has, and will be glad to send to the mills, a voltmeter with an attachment for recording the exact voltage used in a lamp during a certain period of time, by which voltage variation might be checked up. A variation of four or five volts will not hurt anything, he said, but he added that in many cases they had found variations of fifteen to twenty volts, and that when the filament operates on so close a margin, this much variation is risky.

As far as vibration is concerned, he said this has not caused as much trouble generally as has voltage variation, but occasionally they run across a case of excessive vibration. He explained that there are two different types of "shock absorbers" on the market to reduce this vibration in the conduit system of wiring.

Mr. Robertson spoke briefly concerning the candlepower and the necessity for having the proper amount of foot-candles on the work. He said that a large percentage of mills are underlighted which could be properly illuminated through the use of larger lighting units producing more foot-candles.

Following Mr. Robertson's remarks, discussion was invited, and Mr. Poole said, "You spoke about variation in voltage. We all know we have variation, but what are we going to do about it?" Mr. Robertson said that there is no reason for a variation of more than five volts, but that if it occurred the source of light should be investigated and difficulties corrected.

"Do you think a conduit running close to a large drive belt would conduct static electricity and cause lamps to burn out?" asked Mr. Compton. "Static electricity will not burn out anything," Mr. Robertson replied. "There is no ampereage in static electricity." H. E. Runge, of the Draper Corporation, asked for a definition of a foot-candle, referred to by Mr. Robertson, and the reply was that this referred to the relative amount of light or illumination furnished on an object within a given space.

The discussion at this point was turned to other channels, the first subject being that of ball bearings on line shafts. J. H. Hook, superintendent of the Corsicana Cotton Mills, was called upon to give his experience. "We have part of our mill equipped with ball bearing line shafting," he said. "You will not save as much power as you imagine you will. You will save on your friction and that is all. We equipped all the line shafting in the card room with ball bearings, but I found that after installing ball bearings I was not able to save as much power as I had been told I would save.

"There are a lot of advantages, however. They do not require attention that plain bearings require. You grease them two or three times a year and that is all. You do not have the dripping—and there are many other advantages, but there is a question in my mind as to whether or not they mean as much as the salesmen say they do." In reply to Mr. Tatum's question, he said he figured he saved around ten per cent on the friction load. He said they had had ball bearings in for the last five or six years. He added that he had had no trouble with them; that only one had failed and that had been promptly replaced.

Mr. Morton, of Dallas, was the next speaker, and while he could not report favorably on his own installation, he said he did not care to speak against ball bearings as he felt they were a good thing.

Mr. Clark reported that with ball bearings he had a three per cent net saving in the total load, and eighty-five per cent on the friction load.

"I asked some questions about beater speeds and feed roll speeds in the questionnaire," said Mr. Tatum, in changing the discussion, "and I did this with a view to figuring the beats per inch. I am going to read off the beats per inch of the different mills in the pickers as I figured them from the information furnished:

BEATS PER INCH.

	Breaker	Intermediate	Finisher	Total
Dallas Cotton Mills....	37	22	32	91
Corsicana	20	67	..	87
Waco	57	28	..	85
Gonzales	29	47	53	129
McKinney	97	96	(Porcupine)	193
Brenham	18	49	70	137
Belton	85	76	95	256
Denison	32	36	77	145
Waxahachie	21	47	(Porcupine)	68
Cuero	(Porcupine)	87	61	147
Bonham	..	..	..	100

"I think myself that we have an important subject before us on this beats per inch thing," said Mr. Tatum. "I know several of us would do well to experiment on it. We certainly have a big variation out here—the modern thought is to reduce the beats per inch, and I will tell you a little something about what we did.

"We had to use some low grade cotton because we did not get to market soon enough to get our regular grade, and we were having some trouble. We put in another vertical opener and put the two openers in tandem, and also installed five sections of English cleaning trunk, and we got so much more cleaning out of that system that we were able to reduce the beats per inch in the picker room about 25 per cent. We were running around 125 and we reduced to around 100. Our breaking strength immediately improved five to seven per cent and the running of the work in the spinning room improved a great deal and the cloth looked lots better. Because we got the trash out before it got to the beaters. That is one of the objections of beating too much to the inch. The number of beats per inch affect the breaking strength. I believe those fellows who are getting excessively high totals should at least make some experiments and see what they can do. You cannot reduce so much unless you put in the opening equipment. Some mills, when they put in the vertical openers in tandem, have cut out the intermediate pickers. On some numbers that is probably a wise thing to do, but I am not so sure that what we ought to do is to reduce the beats per inch on that to a minimum and keep the intermediates in order to get the doublings there. They are worth more for that than the expense of the man who runs them."

"We made some tests," said Mr. Moak. "We were having trouble with specks and we hunted for the trouble everywhere. Finally we went into the picker room. We use the porcupine beater in the back of the breaker and the blade beater on front. Our blade beater was running 1,150 and 1,200 and we speeded that up to around 1,235 and then went to our finishers, which have a single Kirschner beater, and that we were running about 1,200 to 1,250. I put that up to 1,435 and I found the work a great deal better. I didn't know whether it was the beater speed or not, but we got much cleaner work." Mr. Tatum asked how the breaking strength behaved, and Mr. Moak said that while they had had no complaint on the breaking strength, at the same time he believed it increased.

Mr. Tatum was asked for the average speeds of the beaters as given in the answers to the questionnaire, and he gave the following variations: Porcupine, from 643 to 980; two-blade, from 875 to 1,175; three-blade, from 900 to 1,300; and Kirschner, from 760 to 1,400. Mr. Merritt said that he runs a speed of 900 r.p.m. on his beaters all the way through, with a two-blade beater on the breaker and a Kirschner beater in the finisher.

The much-discussed question of filling wind for warp spinning was next taken up. Mr. Poole had changed over his whole mill at Sherman, and reported an increase in front roll speed from 152 and 156 to 184. He added that his waste had been reduced considerably; that his waste at the spooler had been reduced fifty per cent. He said the only difficulty was at the spooler, and that he finally decided on using the disc tension.

"Did you change bobbins?" asked Mr. Tatum. "We experimented first with the regular warp bobbin," said Mr. Poole, "and then we tried four or five others and finally decided upon one we designed ourselves."

Mr. Morton raised the question, in connection with Mr. Poole's increase in speed, that possibly he wasn't running the warp wind as fast as he could, and continued, "That's a mistake many people make; they are not doing as well as they might with the warp wind, and when the

change is made it shows up really better than it is."

Mr. Moore, of Brenham, was called upon, and said that "my experience with filling wind has been something like that Mr. Poole has had at Sherman. The only thing is we have not increased our speed on the front roller that much, but it was not necessary to do so and we did not go to that trouble. However, we did speed up about ten per cent on the front roller." He said he uses a bunch builder on the warp frame, which allows him to make a bobbin full all the way up. "We have not lost a pound of waste since we have had filling wind," he said. "We put on the LVB tension device and the only trouble was that our spoolers were running too slow. We increased their speed and remedied the trouble. We had a 12-inch pulley on and changed this to a 14-inch and now there is very little trouble." He said, answering a question, that he figured they got about 15 per cent more yarn on the bobbin.

The question was asked whether he found it possible to run with less twist after the change and maintain the breaking strength. "We did not make any tests," was the reply. "We run standard twist on that just the same." Mr. Poole said he runs from two to four teeth less twist and still maintains the breaking strength; he used about 4.50 before, he said.

Frank Burdine, superintendent, Itasca Cotton Manufacturing Company, said he runs filling wind at the same speed, and that there is so much advantage and improvement in the running of the work that he doesn't see how anybody could get along without it. He said their waste now is practically negligible.

"I had some experience with 17,000 spindles on 8s," said Mr. Sords. "We changed from warp wind to filling wind, and we increased the front roll speed from 165 to 180. We had some trouble taking care of the friction on the spoolers, but we overcame that by using the Whitin guide. In regard to putting yarn on the spools, I do not think you can get as much yarn on the spools, but this particular mill was a yarn mill job and we used it from the spoolers to the twisters and I had no way of testing it on the warpers."

Mr. Hook said he changed over at Hillsboro and increased the front roll speed from 155 to 168, and doubled the spooler speed. He said he at first had lots of trouble starting off but that he put on a bunch builder and has not had any difficulty since.

Changing the weight of travelers would have an effect on the running of the work, said Mr. Gibson, who continued by saying that he had taken 16 frames and put eight of them on filling wind and had been able to run with one tooth less twist on the filling wind.

The meeting left filling wind here, and H. G. Edmiston, of the Denison Cotton Mills, explained a method of repairing worn licker-in bearing shafts and journals. He said they secured some seamless steel tubing 1⅛ inch in diameter on the inside and 1 5/16 inch on the outside. Then he reamed out the bearings to an inside diameter of 1 5/16 inches and turned the licker-in journals down and made them to a fit with the tubing, which made them practically as good as new. They have been running about three years, he said. He said that the cost per licker-in was less than a dollar; Mr. Tatum said they had done it and had figured the cost at about 15 cents each. It requires sixteen inches of the tubing for each licker-in. Here Mr. Tatum pointed out that the bearing at this point should run very true, declaring that it was inconsistent to set the licker-in within a thousandth of an inch only to have a worn bearing have play in it which more than offset that.

Another "kink" adopted at Bonham was explained by Ruben Stegall, master mechanic, who said they took the card trumpets and measured them and found them to be of varying size. He said they filled them with brass and then bored them all out to the same diameter, which improved the running of the work considerably.

Mr. Tatum next brought up the matter of old and new ties for baling cloth. He said they had made some tests and found there was economy in bundling up old cotton ties 30 ties in a bundle and selling them to the oil mills at $1.25 a bundle and then purchasing new ties for baling up the cloth. In doing this, he said, he buys a ⅝-inch tie which is a much better tie. He said in addition to the saving, this method expedites the baling, eliminates old ties lying around the room, and is a much better system all the way around. Several questions were asked him. He replied saying that he uses four of these ties on bales of duck, and five on sheetings.

"Did your cloth room man ever take down a bale of duck and see if there was any burlap cut with the narrow tie?" asked a member. The cloth room man at Bonham replied, saying he had never observed any damage; that he had once opened eight or ten bales that were in a railroad wreck, but that the ties didn't cause any damage. A representative from McKinney said they use this tie and that he had noticed no difference in the burlap or cloth.

"What precautions are we taking to eliminate variation before and after stripping cards?" was the next question asked by the chairman. "We are very particular about having all finisher laps run over that vary more than a half a pound each way. Well, one pound in a 50-pound lap is only two per cent. Compare your card sliver five minutes after stripping with it before stripping and you have fully a variation of ten per cent, and most of the time it is nearer twenty per cent lighter, forty per cent for the first half minute. And just to simply let it run out a little will not take care of the trouble. If that variation doesn't hurt us, we needn't be so particular about running our finisher laps over."

In explaining the ways they are trying to overcome this variation, Mr. Tatum said, "We strip all the odd cards first, and then we strip the even cards, not immediately after that, but we strip three times a day, and the stripping is done on schedule so that we distribute the stripping equally throughout the day. In that way the sliver coming from a row of cards has a heavy can mixed with a light can, because each row comes through to the drawing pretty much together. We let each card run a minute or two after it is doffed."

Mr. Moak said he lets his cards run after stripping until the sliver gets somewhere around a reasonable weight. He added, however, that he had found the spoons on the back drawing the best place to eliminate this variation. "We run these just as high as we can run them, and if we happen to have too light a sliver coming through, the frame will knock off, and the drawing hands are trained

(*Continued on page* 861.)

Georgia Mill Men Meet in Atlanta

A combination of a well-rounded program and just the right amount of seasoning in the form of fellowship and entertainment made for the annual convention of the Cotton Manufacturers' Association of Georgia a place with the unqualified successes in textile convention history.

The meeting was held on Tuesday, May 13th, at East Lake Country Club, Atlanta, where the last several conventions of the association have been conducted. The day was well-balanced and every detail went through on splendid schedule. A morning session, a dinner in the evening and a golf tournament in the afternoon, constituted the program.

At the morning session, Rev. W. H. Faust, pastor of the Gordon Street Baptist Church, Atlanta, was called upon for the invocation, following which Lee M. Jordan welcomed the visitors to Atlanta and to the Club, W. J. Vereen making the response, both in a happy vein.

The first order of business taken up was the president's report, presented by P. E. Glenn, secretary-treasurer of the Exposition Cotton Mills, Atlanta, who has served the Association as president during the past year.

As to the Association activities, Mr. Glenn pointed out that the treasurer's report showed that the organization had functioned well within the budget made by the reorganization committee, an accomplishment of which the officers were proud.

Discussing business conditions in textiles, Mr. Glenn said that "A most unsatisfactory condition has confronted us for the past few months, and it does not take a prophet to forsee that this condition will likely prevail for the next several months.

"By reason of our desire to keep our help fully employed, and consequently satisfied, most of the Georgia mills have up to recently operated full time. This, I believe, has been a mistake for which we are paying now and will pay for some time to come. However, there is always a 'silver lining,' and in my judgment when we have elected a president of the United States and determined the size of our new cotton crop, I believe then we will have arrived at the beginning of a most satisfactory period of operation. When these facts have been determined, buyers of our goods will have no reason for holding back, and I predict that they will be as actively in the market then as they are inactive and out of it now. Europe's program in taking America's cotton so freely at this time and at these prices should be a warning to our American buyers of cotton goods. Cotton now being exported cannot reach destination, be manufactured and distributed before the new crop is on us, hence the foreign merchants and manufacturers are backing their judgment, that the early months of the growing crop will not sell below present prices. Our foreign competitors know that the new crop is from two to three weeks late, that the desirable grades of cotton in America are getting scarcer every day and that by the time the new crop is ready for the market there will be a wild scramble by American mills for the first offerings. There is a probability of October cotton selling higher than spots today."

As to the disposition of the Muscle Shoals property by the government, Mr. Glenn said, "I believe that as an Association, and individually, we should thoroughly inform ourselves as to all details concerning the leasing or sale of Muscle Shoals to a private individual or private corporation. After such information is acquired and digested I believe this Association should take, and vigorously assert, its position with reference thereto, such action to be taken through its executive committee."

With reference to tariff, Mr. Glenn stated that "it is to the interest of the cotton planters, dealers and manufacturers to take an intelligent interest in the question of a duty on imports of cotton goods. Opinions to be formed on this question as a result of thorough study and investi-

President P. E. Glenn.

gation and free from any preconceived prejudices on the subject."

Mr. Glenn said that in his opinion, the Association should adopt a uniform purchase contract for spot cotton, the general terms of this contract to be agreed on by representatives of the southern state associations of cotton mills, merchants and farmers. Such a uniform contract, fair to all parties, would, he pointed out, prevent many differences and some litigation.

"It would be to our material benefit to have Atlanta designated by the Federal Department of Agriculture as a point of arbitration of cotton contracts,' 'continued Mr. Glenn. "Atlanta should also be made a point of delivery, and I urge you to give your individual assistance to the Atlanta Commercial Exchange and the Cotton Merchants' Association in bringing this about.

"Our hearty cooperation and assistance should be given freely to the various agencies now at work fighting the

boll weevil menace, also to those agencies seeking to improve the variety of cotton seed and the staple of cotton."

Discussing the constantly increasing cost of compensation insurance, Mr. Glenn suggested an investigation concerning the feasibility of establishing a mutual compensation insurance bureau. He added that in his opinion the Association should work out a plan for the assembling of certain statistical information to be used and given out in totals only, for the benefit of the members and for the information of the public.

"The Association has gone on record against child labor, and the individual members are opposed to the employment of children under the legal age and to maintain this position thoroughly, it is our duty to see that none of our superintendents or overseers is lax in his investigations of the legal and moral right of any applicant for work."

In Mr. Glenn's opinion, the Association and all individual members, together with every employee, should in every way possible and at all times conduct a campaign of education along the lines of impressing the people of Georgia with the value of cotton mills in the state to every class of citizens. "The public should be kept constantly informed of what we have accomplished up to now without coercion or restriction, and what we hope to accomplish as fast as conditions and developments warrant," he said.

Mr. Glenn urged cooperation with local school authorities in keeping in school mill children who should be there. He further suggested a revolving scholarship fund at the A. French Textile School of the Georgia School of Technology for providing assistance to worthy young men ambitious to obtain a technical education.

The president complimented the traffic department and the secretary's office for their valued assistance to the mills, and urged fullest cooperation and assistance with them on the part of the mills.

As a concluding suggestion, Mr. Glenn said that "in line with the idea of making our mills and villages as comfortable and attractive as possible let me urge you to encourage your superintendents to spend a little money in keeping up your mill yards and villages. A little money judiciously spent for shrubbery and flowers returns handsome dividends in the pleasure your employees enjoy in living and working in well kept surroundings. It also impresses the public more than the size or equipment of your mills."

Secretary W. M. McLaurine next read his report and also that of C. W. Chears, traffic manager of the Association.

At this point the president asked Mr. Jordan to introduce as a visitor the president of the Alabama association, T. Scott Roberts, who made a very happy talk much enjoyed by the members.

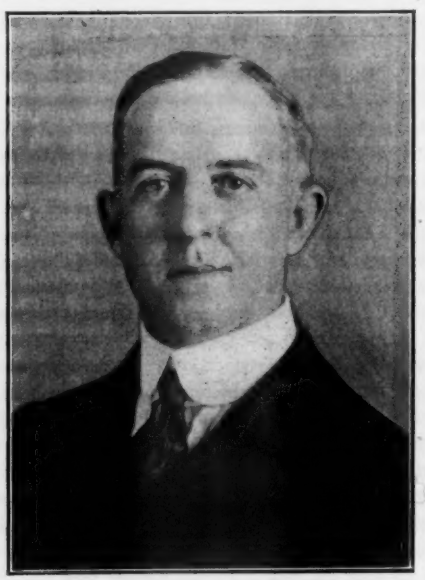
David Clark, of Charlotte, next made a special report regarding legislation affecting the textile industry.

The next feature on the program was a discussion on cotton hedging. This was introduced by George S. Harris, president and manager of the Exposition Cotton Mills.

Hedging Cotton.

"The question of hedging cotton is an interesting one, as I have experienced quite a bit of worry over it in the last two or three years," said Mr. Harris. "I don't feel that we should be called on to be risking our stockholders' money by backing our judgment on what the price of cotton is going to be, but we have been forced into that. We have had the price of cotton to fluctuate within three months enough to break a mill. Some have gotten rich and some have gone broke.

"It brings us back to our Cotton Exchanges and Hedge Market. When we studied Economics in college, we were taught that the speculator was justified. Why? Because, when the legitimate consumers of a commodity were all in the market at once, the price steadily rises, and the speculator is supposed to step in there and stop it. Likewise, when the business of the legitimate consumers of a commodity is weak, and we are out of the market and the price drops, the speculator comes in and stops the drop; but with our market it works just the other way.



W. M. McLaurine, Secretary.

The speculators push it down and the speculators push it up at the times when it hurts us most. I am wondering where we can get with it. I thought that I would want to tell you something about it, but the more I thought about it the less I found I knew about it.

"About that time the Federal Trade Commission came along with a long interesting report, as they had been thinking about it. When I went into that, I concluded they knew less about it than I knew about it. There were some interesting things in that report, but most of them were old.

"I believe something is rotten in Denmark, but I dont' live in Denmark, so I don't know what it is. I hoped by introducing this thing that somebody, who knows more about it than I do, will tell us what it is. The Federal Trade Commission does inject into that some interesting points. The question of tendering grades on contracts is an old subject, but I think it is time for this Association probably to take a position on it. It may be like a little bulldog on the street barking at a big horse, but he can be a bulldog just the same, and worry the horse. The thing is worrying us very much. We are forced to back our judgment on cotton with our stockholders' money. As Mr. Glenn says, I have been a sufferer, and I have been

trying to run the business legitimately, but I can't do it. I have got to gamble it out and I don't like it.

"Now what I am going to attempt to do is simply to introduce the subject without trying to tell you something that I might think that I know about it, because I don't know. We have here with us a few men, who are *supposed* to know, anyway. We will let them tell us something about these contract markets, and what is the matter with them. They certainly don't function. Next Fall, in October and November, when I buy cotton at the highest point in the season, as we did this past season, I think I will sell wheat contracts in Chicago against that cotton, and I think I will have a better hedge than if I sell cotton contracts on the New York Exchange. I think I will get out of it better. I am in hot water all the time."

Following his own remarks, Mr. Harris called upon Henry Plauche, assistant secretary of the New Orleans Cotton Exchange, who discussed the subject of "Cotton Hedging, or Price Insurance."

"A 'hedge' defined by Webster is 'to safeguard one's self from loss by making compensatory arrangements on the other side,'" began Mr. Plauche. "In the ordinary language of commerce its meaning is price insurance.

"The cotton merchant who buys spot cotton in the primary markets is forced to buy the general run of receipts coming to market and assorts various purchases into like grades when he has concentrated a certain quantity. This cotton is not usually sold at the time of purchase and in order to protect himself the merchant must take out price insurance, and this he does by selling an equal amount of contracts for delivery in a certain month in the future. Again, if a manufacturer receives an order in the summer for a certain class of goods deliverable the next winter he can accept the order provided he is able to secure the required quantity of cotton at the prices obtaining at the time the order is received. He has two roadways opened to him; buy the cotton at the prevailing price, store it and carry it until he must spin it, or protect himself by buying contracts for future delivery. In the former case not only is the procedure risky but is very expensive, as it is a well-known axiom in business that carrying charges 'eat one up'; in the latter case he saves all these carrying charges and at the same time insures himself against loss. There is a third avenue more hazardous in every respect than the other two, unfortunately resorted to quite often, which the manufacturer can use, and that is to take a long chance that the price of raw cotton will remain stationary or decline.

"By means of the Future Contract, there is no day or hour in the day that cotton may not be bought or sold and it is this that makes cotton the most liquid asset known to the world's trade.

"It constitutes a method of price insurance that may be likened to the vast system of fire and marine insurance without which living would be relegated to the realms of barbarism. It has repeatedly been urged that a great evil is that the sales of Future Contracts are annually many times the volume of the cotton crop. Is it an evil? Every time a piece of real estate or an article of merchandise, in transit to the consumer, changes hands it is insured so that the aggregate of such insurances is many times the aggregate value of the fixed or movable articles of trade and commerce. So it is with cotton; every time it changes hands it is made the subject of a Future Contract for price insurance. While it is true that not all of the cotton is hedged or insured through the Future Markets, most of it is and as cotton not infrequently changes ownership six to eight times from the producer to the final consumer, the number of price insurances or hedges is increased accordingly. Transfers of hedges from month to month also swell the total of future transactions. In a word, the aggregate of future transactions from day to day involves sales and resales, purchases and repurchases of the same risks, and are, therefore, not all original transactions, any more than bank clearances show the net amount of money that is transferred on balances.

"Much as has been said of speculative features of the

George S. Harris, the President-Elect.

Future Market, it is the means of avoiding speculation or risk by both sellers and buyers of spot cotton. This, in reality, is the most valuable feature of the system. What would have happened when the so-called buyers' strike was ushered in during 1920 had there been no such system of price insurance? Cotton in common with every other commodity and articles of trade suffered a drastic decline from $182 a bale in July, 1920, to $59 in July, 1921. Such a sheer drop, involving hundreds of millions of dollars would have wrecked the financial institutions of the South had it not been that a large proportion of the cotton held was hedged. Bad as the consequences of the decline were, a condition undescribable in its effect would have resulted.

"In an attempt to outline succinctly the forward or future delivery business and what it is, I can not do better than to repeat the description of Colonel Henry G. Hester, Secretary of the New Orleans Cotton Exchange, which is as follows:

> "'The contracts are known as Section 5 Contracts, as that section of the U. S. Cotton Futures Act and the regulations of the Secretary of Agriculture constitute the limitations thereof.
>
> "'(a) The provisions of the Act are that all contracts made for Future Delivery on any exchange, board of trade

or similar institution, place of business, not in conformity with the U. S. Cotton Futures Act are subject to a tax of 2 cents per pound.

"'(b) The contract must specify the basis grade of the cotton involved which shall be one of the grades for which standards are established by the Secretary of Agriculture. Middling shall be deemed the basis grade if no other grade be specified in the contract.

"'(c) All cotton dealt with shall be of or within the grades specified by the Secretary of Agriculture.

"'(d) Cotton delivered on such contracts above or below the basis grade must be settled for at actual commercial differences above or below the contract price for the basis grade.

"'(e) No cotton may be delivered that is below low middling or that is reduced below the value of low middling because of defects, etc., (see act) and is of less than seven-eighths of an inch in length and staple.

"'(f) Tenders on contracts must be the full number of bales involved or the equivalent weight thereof and the person making the tender shall give written notice five business days before delivery to the receiver and in advance of final settlement must furnish the receiver a written notice or certificate stating the grade of each individual bale and by means of numbers identifying each bale with its grade.

"'(g) All cotton delivered must be classed in accordance with the classification, made under the regulations of the Secretary of Agriculture, by officers of the government designated by the Secretary for that purpose.

"'Under these regulations all cotton delivered on Future Delivery Contracts is inspected and classed by government officials who issue certificates therefor; in other words, under the law the government becomes a party to the final settlement of the contracts, insuring the honesty, correctness and uniformity of such deliveries.

"'The contract is a strictly legal contract and the seller is forced to deliver and the receiver to receive the goods specified therein.

"'As in all contracts made for any article of produce or merchandise, the parties thereto may obtain legal offsets transferring their rights for fulfillment to other parties before maturity by means of substitution of like contracts, differing only as to price.'

"There is perhaps no more constructive piece of legislation on our statute books than the United States Cotton Futures Act. It regulates the business within the lines of reason and justice and is helpful to producers, traders, and consumers of spot cotton in the United States. If the act has a fault, it lies in the restriction of the number of grades tenderable on contract and to that extent lessens hedge protection of a material percentage of the total annual growth. The result of this is seen in the frequent wide disparity between grades tenderable and untenderable. The disposition in some quarters to further limit the number of grades tenderable for that reason cannot prove otherwise than harmful; in fact, further limitations would so circumscribe the number of sellers (and consequently buyers) in this country as to destroy the hedge features, resulting in closing American Exchanges. Legislative experiments of this nature would not merely prove harmful but would be futile.

"Perhaps it may be advisable to allude to the claim that has been urged that the Cotton Future Business should be so adjusted that a spinner should be able to buy in the future market such grades as he may desire for his own use. A few moments concentrated thought would prove to any thinking man the impossibility of such a change and that the only effect would be to destroy the futures market as now constituted with its value for hedge purposes.

"In all there are a great many different specifications of grade, color, character, staple, etc., which enter into the spot business. Each and every one of these specifications are made the subject of specific contracts between the seller and the buyer. Every spinner has his own special wants which he fills by means of special agreements therefor. But it may be said, 'make your contract to embrance spinnable cotton.'

"What is spinnable cotton? Nearly all cotton is spinnable for some purpose or another. Even some grades of linters are spinnable and when you enter into this question you enter into a field that is almost limitless.

"There is in reality no form of Cotton Futures Contract that will be dealt in generally, which will have a ready market from day to day, and, from hour to hour, except the one now in use in the Exchanges of New Orleans, New York and Liverpool. That contract practically embraces all that is desirable of the cotton crop.

"I hear someone say, "Yes, and much that is undesirable." Nay! You are mistaken. As the late General Magruder of Confederate fame once said of whiskey, 'Some kinds are better than others but it is all good.' Perhaps it may be acknowledged that all cotton is not good, but no one will contend that it is not all desired by someone for some purpose.

"Let us see how the figures compare.

"(I am not going into a dry statistical compilation. In these days of prohibition one must not be too dry because there is no way to counteract it by 'wetting up.')

"Five years ago we had a

Carry over of 4,422,000

Since then

Production including linters was 57,686,000

So we have had a supply of 62,108,000

The carry over last year was 2,573,000

So that during the past five years the

Number of bales that have disappeared was.59,535,000

"This embraced all kinds of cotton, good, bad, or indifferent, yet it was desired by someone for some purpose and it has all been consumed. Now, the cotton future contract embraced most of this cotton that has gone out of sight in one shape or another.

"This brings me to the thought which you will all recognize: that the Future Contract is for cotton of the crop as grown. For instance, the basis grade is put at middling. This does not mean it is a middling contract. That grade is only specified in order to arrive at a proper adjustment of values in proportion to the grades delivered. When a man buys or sells a Cotton Future Contract he deals in any and all grades within the limits of the specifications of the United States Cotton Futures Act and the buyer expects to receive and the seller expects to deliver any of the grades embraced at their commercial values, either above or below middling.

"I do not say that such a contract is an exact hedge for any specific grade or staple or color, but it is a representative of the average of most of the crop and that is really as close as it is possible to reach in the way of price insurance.

"And this is the case in insurance of most any article insured. It rarely happens that an exact loss is recouped by insurance. The things themselves may be paid for in part or in whole, but whether a man has his home or his store destroyed there are many things that enter into the loss that may not or are not compensated for. This, it may be said, is a truism, but I merely mention it to illustrate that in most things as well as in cotton prices the insurance is never exact.

"There is another thing about this specific grade question and that is that while a man or a mill individually may be willing, and they do make such contracts, people generally would not be willing to do so. There is no way to form a contract for cotton that will be generally entered into between buyers and sellers from day to day except such as embrace practically all grades obtainable. In any other form of contract the sellers who would be willing

to assume the risks of delivering would be so few that the business would amount to naught. For every contract there must be a seller and a buyer; omit either and there can be no contract. Substitute specific grade contracts for the present form and you would close the future exchanges and do away with hedging as price insurance as it now exists.

"The Rules of the New Orleans Cotton Exchange conform strictly to the requirements of the United States Cotton Futures Act and are fair alike to both buyers and sellers doing justice to both and conferring special privileges on none. Under the system obtaining in New Orleans each bale is represented by an individual receipt upon which is shown the weight of the cotton, whether flat or compressed, and the certificate of the United States Government of the grade and staple. Thus after a bale is certificated, the owner, be he deliverer or receiver, can dispose of each bale individually without the costly expenditure of re-handling and re-certificating which would result if the certificate were for a number of bales.

"In brief, the consummation of a Future Contract is made to fit into the spot trade in a manner that cuts out much of the old time costs of handling spot cotton. Practically in New Orleans we have abrogated most of the old time costs of handling and deliveries, both of spots and futures. Each and every bale that is brought to our market stands upon its own merits. The cost of seggregating specific grades from a lot of various grades is minimized and the seller or buyer may pick out the bales he may desire and transfer them for delivery on contracts or for shipment by means of the single bale warehouse receipts with almost the same facility, allowing for the bulky character of the bales, as you may separate the five, ten, and twenty-dollar bills from a package of currency. The system is the result of years of thought and careful deliberation and has been conceived in keeping with the spirit of the age which is to simplify and economize in every possible direction, and today we can sell and deliver selections from lots of spot cotton with an ease and facility that has revolutionized ancient methods. If you receive various grades on a future contract, we have so arranged that you may pick out what you want and re-deliver or sell bales you do not need, each and every one of which is covered, as just stated, by a separate warehouse receipt that tells its grade, weight, etc., without the necessity for re-classing and re-handling.

"Our methods meet the convenience of the handler whether he be a factor, cooperative manager, or mill owner, etc. By these methods benefits accrue all along the line from the producer to the ultimate consumer, eliminating useless charges and losses from re-handling.

"Now, in conclusion, a word in reference to the so-called speculative feature of the Future Contract and I have done.

"There is a general idea that the bulk of the Future Business is speculation, and to carry it further, that speculation is gambling. The real facts are that fully eighty, if not eighty-five per cent, of the contracts for future delivery are based upon spot cotton in its transition from the field to the loom. The remaining fifteen per cent is for speculation or investment and the opportunities for such operations are evolved from a highly balanced organism which exists in this country and abroad for the economic handling of cotton by means of Future Contracts hedging. It is a misnomer to characterize that the variations in the prices of cotton are the result of speculation or gambling. The speculator is the man who sees or thinks he sees an opportunity to make profit from conditions that are world wide. He buys when he thinks an article is too low and he sells when he thinks its too high. Did it never occur to you that such people are found in every market in every article of trade or barter? He is not a gambler who stakes his all on the throw of a die or the turn of a wheel. Generally he is a man who studies economics and his acts in the main are akin to those of most people in the entire world. His use is that he supplies capital frequently when it is most needed, when an article 'goes begging' for want of a satisfactory market, and if he sells short in a runaway market he often acts as a balance wheel, assuming the risk of possible declines in values. Either way he supplies capital which is part of the basis of hedges by the cotton buyer who sells to hedge or the mill man who buys to hedge.

"It must be remembered that purchases and sales in the New Orleans and New York markets are by no manner of means, whether for spot price protection or for speculative investment, bets on prices. The contracts dealt in are strictly legal, calling for the actual cotton and the broker who uses them is bound to receive or deliver as the case may be, unless he obtains a strictly legal offset the same as may be and is done in trading in any other article of commerce. The contract represents cotton the same as a dollar bill represents the coin with which it may be liquidated if or when call is made therefor. The holder of a Cotton Futures Contract at maturity must take or deliver the cotton and is not permitted to settle on market differences. Were it otherwise such transactions would be in the nature of bucketing and would have no connection with cotton no matter how so-called. It is this fact that links the cotton futures contract inseparably with the cotton crop as grown and marketed from year to year and which constitutes its value as price insurance—as a method by which the spot handler avoids speculation; and it is the fact that the contract calls for practically all of the desirable grades grown and is not limited to a few contiguous grades, that gives it currency as a universal hedge.

"Like all other human inventions the system may have its imperfections, but the same may be alleged of everything human. There is in fact few laws on the Statute books of the States or the Federation of States, no matter how beneficial, that may not work injustice in exceptional individual instances.

"As it is, the modern methods of hedging are as far ahead of former trade systems as the trolley car is in advance of the old mule car system. It is acknowledged as a necessity on both sides of the Atlantic and were our legislators to tinker with it so as to destroy its usefulness at home the merchants and manufacturers of the old world would still insist upon it for their own protection and profit. With us it is there for our use or to let alone as each individual may deem best, but it is as inevitable as the sun shines that retrogression from modern methods means for those who favor and act upon it a leap into the dark with attendant loss and disaster.

"A word further and I am through. It has been said in high legislative circles that the way to improve the Future Contract and to bring its value into closer touch with the spot market would be to limit the grades tender-

(*Continued on page* 859.)

Weaving Division Meets at Spartanburg

Discussion of sizing definitions and problems occupied the major portion of the meeting held by the Weaving Division of the Southern Textile Association at Spartanburg, S. C., on Friday, May 16th. The meeting was well attended, and was featured by two interesting talks, one by Dr. W. R. Cathcart, technical director of the Corn Products Refining Company, New York, and the other by Paul Seydel, of the Seydel-Thomas Company, Atlanta.

W. H. Gibson, Jr., chairman of the Weaving Division, conducted the meeting, and explaining the nature of the gathering, said that "we have felt for a long time that this organization needed men to come before us who could answer questions which the mill overseer and superintendent are not quite clear on, in regard to starches and chemicals and slashing. There are certain questions a man cannot answer unless he is a chemist, and we believed by devoting a meeting to this subject, and having competent men to appear before us, we could derive more benefit than by hitting the high spots."

It was pointed out that there has developed some discussion among the Association members, particularly at the recent Augusta meeting, on the definition of terms used in sizing, especially the terms "fluidity" and "viscosity." It was to the clarification of these terms that Dr. Cathcart devoted the major part of his talk.

"I want first of all to express my pleasure at the invitation extended to me to talk to you men on a subject in which you are interested and in which I am very much interested," said Dr. Cathcart. "It was my understanding with your chairman that it would be in accordance with your wishes if I did not prepare a formal paper, and so I have not done so. I am very glad that arrangement was arrived at because in a formal paper a man usually puts the emphasis on that phase of the subject in which he is particularly interested, and very frequently it so happens that the audience is very much interested in some other phases. So I wish to make a few rather general remarks and then put myself in your hands entirely to direct the trend of the discussions, and to give such assistance as I am able to render in that discussion.

"The great difficulty that a chemist has in talking to an audience of practical men is to use language that everybody who is not a chemist can understand. That point was very forcibly impressed upon me quite recently when I attended the meeting of the American Chemical Society at Washington, where there were about 3,000 chemists from all over the country, and we had the pleasure of listening to Dr. Slosson, who emphasized that point in this way. He talked about a paragraph of, say, 50 to 100 words, using very intricate terms describing a process, and ended by saying that it meant 'a man had made a fire.' You can do that with almost any subject with a chemical bearing. In discussing the subject of starches and their application for sizing I shall endeavor to avoid any such trend of speech. By the way—I hope you will make it a point, if you have not already done so, to read a book by Dr. Slosson called Creative Chemistry. It is a book you will read like a novel and I am sure you will enjoy it.

"Just after the Washington meeting I attended the meeting of the National Association of Cotton Manufacturers in Boston, and listened to a paper on starches and sizing, and I very much regret to say that when that paper had been concluded I felt that the situation had been very badly muddled, because the terms used were not sufficiently clear to give the audience the proper conception of the importance of the different facts of starch and the use of sizing and starches.

"Please do not hesitate to ask for any explanation of terms that I might use. My intent and purpose is to be entirely frank and straightforward, and I hope that when we have finished with this discussion we will have got somewhere and have a proper and better grasp of the subject than before we started.

"Referring to the Augusta meeting, which your chairman has mentioned, I have been told that at that meeting —and I learned from the accounts of the meeting which I read—that the audience was very much interested in thin boiling starches and the terms which are used in connection with such starches, notably the expressions 'fluidity' and 'viscosity'. If that point is still of interest to the meeting I shall be glad to say a few words along that line."

"That's just what we want to know about," said Chairman Gibson.

"I think perhaps it would be well to give a little bit of sizing history before we get right down to detail, then," said Dr. Cathcart, continuing. "You know, when the textile industry was first brought into this country it came over from England, and the methods and processes which were in use on the other side were the first ones used in this country. It so happened that when the process of sizing was taken up the methods that were used in England were the methods which the pioneers in this country adopted, as they had been accustomed to using them in England. That meant that as far as starch was concerned that they know only about potato and perhaps sago and tapioca.

"The manufacture of corn starch is essentially an American industry, where the producers of corn starch are. Naturally, the crude material was most generally used for the product starches at first. When corn starch was produced they looked around for outlets for the products and the textile industry came into attention. It then became the job of the producers to get the users of such materials in the textile industry to at least try corn starch. When corn starch was first converted there was nothing but the crudest form of corn starch, or pearl starch as it is called, which represents the first separation of starch in the manufacture of corn starch, and that was what was first offered and used

"It was soon found that the pearl starch did not have all the properties that a starch ought to have and give satisfactory results in the textile industry, and therefore the manufacturers of corn starch set about to improve the product and bring it more in line with the requirements of the industry, and without going too much into detail: this resulted in the production of modified corn starch, or what we call the thin boiling starches. After the manufacturing process had been worked out and other properties determined they were offered to the textile industry and gradually they became more and more popular in that industry.

"The modified corn starch is a starch which has in different processes of manufacture undergone a treatment which changes the many characteristics of the final product. Briefly, that modification is this: Starch, when treated with acid, very dilute acid, under certain conditions of temperature, concentration and time, undergoes changes and if the treatment is carried on under proper conditions, a starch is changed finally into sugar. That process is called hydrolosis; it is the same process that takes place in the human body in the digestive process when you eat food that contains starch. That is what you get when you allow the process of hydrolosis to go to its full completion. Hydrolosis is a technical chemical term which simply means the change that takes place in something when this change of chemical action of converting it from starch into something that is not starch, namely sugar—I am not referring to cane sugar, I mean sugar as a class, because dextrose is the sugar which is formed.

"If this process of hydrolosis is controlled and arrested in its incipient stages, then you will get a product which is still starch, but starch with different properties than starch had before this process was used. The point at which that process is stopped, that hydrolosis is arrested, will determine the properties of the starch which you are going to get. That results in the formation of the so-called modified or thin boiling starch.

"It was very early found that when this modification process was arrested at different stages, and the starch properties at these different stages determined, using the same quantity of water and the same weight of starch and boiling for the same length of time, without any addition due to condensation or loss of water from evaporation, that the pastes thus obtained were quite different from the pastes obtained from equal quantities of starch and water unmodified. The principal difference found was these pastes were thinner than the pastes formed by the ordinary unmodified starch, and the starches were then called 'thin boiling'.

"It became necessary to devise some method by which these modified starches could be standardized so that you would know what you were talking about when you referred to a thin boiling starch. Before the thin boiling starches were developed it was important to emphasize the thickness of starch pastes; a starch was good or bad according to how thick the paste made from that starch was, and in order to use a highbrow term instead of speaking about thickness, it was fashionable to talk about 'viscosity' of starch pastes, and when you said that one starch paste was more 'viscous' than another, you meant one was thicker than another. This was when emphasis was laid upon thickness.

"When thin boiling starches came into use and attracted recognition, it became necessary to put emphasis not upon the thickness, but upon the thinness, and to get a term that would express it, corresponding to viscosity, the term 'fluidity' was selected.

"There is absolutely no difference between fluidity and viscosity as terms; they are just different ways of expressing exactly the same thing. Fluidity and viscosity are only indirectly connected with adhesiveness. You can have highly viscous substances with no adhesive properties—you have lubricating oils that are highly viscous that will not possess a bit of adhesive quality. You can have highly fluid substances, like ether, alcohol, etc., that have absolutely no adhesive properties. I want to make that point very clear.

"Viscosity and fluidity are simply reciprocal terms. High viscosity means low fluidity. It is just the same thing as when you speak of how long or short a board is—you are speaking of units of length, and that is all there is to viscosity and fluidity as applied to starches."

It became necessary to be able to measure viscosity and to measure fluidity, Dr. Cathcart pointed out, and since viscosity was a more usual term than fluidity at first, the so-called viscometers were devised to measure viscous liquids of various kinds.

It was very soon found, he continued, that the viscometer, simply an instrument for measuring viscosity, was not suitable for measuring starch pastes, as the same results could not be secured from any two of them, and as

W. H. Gibson, Jr., Chairman of the Weaving Division.

it very soon became evident that starches of different degrees of fluidity were desirable, that they must have a certain range in order to meet the requirements of the textile industry, Hampden Buell devised a method of measuring the fluidity of starches. This Dr. Cathcart described as simply a glass funnel with an opening in it of a determined diameter, through which the starch was poured, the rate of flow of the paste through the aperture determining the degree of fluidity.

The speaker continued that because of the variation in results from different instruments, even of the same make, it was necessary to provide a master instrument, which, he said, involved the same principle as was used in determining the meter as a unit of measurement. The other instruments used, and the results of tests made therewith, were to be compared with the master instrument, and thus the true valuation of the fluidity of the paste made with the particular instrument determined.

"Having the standard thus fixed and preserved," continued Dr. Cathcart, "any starch may be examined and compared, and you can always know what fluidity you get.

"For the practical purposes of the textile industry, certain stages of fluidity have been selected. Any number is theoretically possible, but certain stages of fluidity have been selected especially adaptable to the textile industry, and that is why you hear so much about 20 fluidity, 30 fluidity, 40 fluidity, 75 fluidity, 90 fluidity, and the like. They all are referred to the master instrument, and it doesn't make any difference to the user of starch whether that starch is called 35, or 40, or 60 fluidity—all that he is interested in is in having made his selection, to be certain that he always get the same degree no matter what it is called.

"I have told you something about the 'rough mechanics' of fluidity, but there is a great deal more to fluidity determination. The amount of starch has to be weighed correctly, with due consideration given to moisture and chemical balance. You must do everything exactly correct. The pastes have to made with absolute accuracy as to proportion. The stirring of these pastes has to be done with absolute accuracy. Temperature has to be controlled within one-tenth of a degree, and the time of stirring constant. When you observe all of these precautions exactly, you will get concordant results, if you use the same instrument. That is where the difficulty comes in and that is why I always advise users of starch not to attempt to make fluidity determinations. I will gladly give them all the assistance they want, and I have sent out many copies of Mr. Buell's paper. I have given them starches that have been standardized according to accepted standards, so that they get it corresponding to the proper standards. I do not know of anybody that is adequately equipped in their mill to make determinations of fluidity, simply because they do not have the proper instruments, or the experienced operators. There is no mystery about it, no more than about a Bessemer steel converter. The man who does it has to be trained. He knows how to do it better than anybody else because that is his business, he does it every day. Most people who have attempted to make fluidity determinations get into all sorts of difficulties. I know of a very prominent plant in the North that attempted to do something of that kind, and upon the basis of their determinations, they rejected a shipment of starch that had come to them. We were absolutely certain that that shipment was up to standard of the sample from their plant. I went down to see these people and asked them upon what basis they were rejecting the starch. They said, 'We have tested it in our laboratory and the paste is not what it should be.' I asked if they had actually made a batch and tested it out in the mill, and they said, 'No.' I induced them to do this and they made a batch and it was all right and they were satisfied and accepted the starch, but according to their laboratory tests, because they were not equipped, they had condemned the starch.

"It isn't that anybody is trying to mystify you. The thing is being worked out for you and ready to eat.

"The question has been asked, why is it that there is such a wide variation between thin boiling starches that come from different sources? You already have the explanation. They have different standards; they have different standards, but they are fairly close together. It is difficult enough for two laboratories in the same organization to get concordant results simply because if you get two different chemists working on the same problem each one is trying to do better than what he has been told. It isn't a question of whether one method is better than the other.

"It doesn't make any difference to the man who is using the starch what they call it, if he has selected a type of starch which gives him the best results, he is only interested in getting these same properties in every shipment that he gets, and when he doesn't get it he should kick, and kick hard."

At this point Mr. Gibson told Dr. Cathcart that "there was one question which was asked in Augusta and you have practically answered it, and that was that it seemed one concern had taken this master instrument and locked it up in the safe and nobody knew anything about it."

Mr. Chapman repeated the experience related by several at the Augusta meeting by saying that he had bought what was supposed to be 40 fluidity starch from different people, and that with the one he had to use 130 pounds of starch in a mixing while it was necessary to use only 115 of the other company's 40 fluidity. Mr. Gibson suggested in this connection that it might be possible to obtain a list of the fluidities of the different companies, determine their relative values, and thus enable a mill changing from one fluidity to another to know just what to secure in order to obtain the desired result.

"All you have got to do is to send a sample of the starch to the concern you want to buy from," said Dr. Cathcart, "and they will give you a match for it. It is a very difficult matter to produce thin boiling starches of uniform fluidity. Suppose for your work you are using a 20 fluidity starch and you get a shipment from another concern; although you may have ordered 20 fluidity it is different, they may have attempted to get 20 fluidity starch and it may have come out 30 or 40. All you are interested in is in getting a starch with the same properties. The thing that will solve the problem is for the mills to insist upon getting a starch of uniform quality and uniform fluidity no matter whether that is called 30 or 40, or what not."

Mr. Chapman asked whether it would be possible for the starch manufacturers to arrive at an understanding in the matter, and Dr. Cathcart pointed out it would be impossible for the starch industry as a whole to adopt the fluidity of any one concern.

"I think the solution of the whole thing is to find the fluidity that is giving you the best results and then stick to it," declared T. J. Digby, superintendent, Oakland Cotton Mills, Newberry, S. C.

"If you were to send me a sample of starch and say, 'I want to know whether you can give me a starch with the same fluidity,' I wouldn't care whether you told me it was 30 fluidity or 40 fluidity, I would have that determined, and write you whether I could match it or not," said Dr. Cathcart. "You might send me a sample marked x-fluidity, and I would send you a 30 fluidity that would match it."

"Then you would suggest that we always send a sample?" asked Mr. Chapman.

"Absolutely," replied Dr. Cathcart. "If you got the concerns to give a written agreement as to how the determination should be made, it wouldn't mean anything, because of the operator in the laboratory you have the human factor. It isn't a question of the different manufacturers getting together."

Mr. Gibson told Dr. Cathcart that "a few months ago I visited a mill that was taking pearl starch and converting it in the kettle to what they thought was a thin boiling starch."

"That is entirely possible," said Dr. Cathcart. However, he read an extract from an appendix of a book on the mixture and preparation of size by Percy Bean, wherein it was pointed out that while this could be done under mill conditions, the results were unreliable, because of the inability to properly control the factors entering into the proposition. "It can be done," said Dr. Cathcart, "but how you are going to control these things, I do not know, because it is a question of time, temperature and concentration. When thin boiling starches are made they are made by the weight process in enormous vats, under strict temperature control, and time control, and concentration control, and not only that, but every single batch is tested for fluidity before it is sent out. You have no way of regulating these, and you cannot know whether you are getting what you want at all."

Mr. Digby said it seemed to him that the question in the minds of most of the men was the "relative effect of a 20 fluidity and a 40 fluidity starch on the yarn and the general manufacturing conditions of the cotton goods."

"Yes sir," agreed Dr. Cathcart, "and the answer to that is what I was just about to say. It all comes back to the whole subject of sizing. What is the fundamental principle of sizing? It is capillary attraction. Capillary attraction is what takes place in an ordinary lamp wick when you place it in oil. The oil travels into that wick and up the wick to the end. Capillary attraction is simply a term which has been applied to liquid substances in containers or tubes of very small diameter. If you take a glass tube with a very small bore and put it in a glass of water, you will find that the level of the water on the inside of the tube is higher than the level on the outside of the tube. That level has been drawn up by capillary attraction." Dr. Cathcart explained that capillary action in sizing a yarn brought the liquid into the interstices between the individual fibers, and not into the fibers themselves.

"Capillary action is influenced by a great many things," he continued. "For instance, by the viscosity or fluidity of the solution, by the temperature, concentration, and so on. It is influenced by the twist in your yarn because the channels in a tightly twisted yarn are different from the channels in a loosely twisted yarn. Capillary attraction is also influenced by the purity of your cotton. If you have a yarn that has a high wax content—or to make it extreme, if it has already been impregnated with paraffin—the capillary attraction will be different than for such materials as are used at present.

"The question as to whether one should use a 20 or a 40 fluidity depends entirely upon the local conditions of the mill. Nobody can stand off and dogmatically say you should use a 20 or a 40. What you want to do is to see what conditions you are after. Everybody sizes yarn to improve the weaving qualities, and after that you have two classes. One man might say, 'I want the maximum amount of starch on the yarn with the maximum amount of weaving quality.' Another man will say, 'Give me the maximum amount of weaving quality with a minimum amount of size. There are reasons for both. Thus it is necessary to determine by analysis the amount of size that has been put on under the conditions which at that time existed, and then know in which direction you want to work, whether you want to work for additional weight or reduced weight and additional strength."

C. H. Lockman, of Union, asked Dr. Cathcart, "How can I tell the difference if they put in a 30 instead of a 20 fluidity?" "You ought not to get a variation of that kind," answered Dr. Cathcart, "and if you do, the way you have for telling is to observe the size and observe the work. You can tell the difference in 20 and 30 by the appearance in the size kettle. 30 fluidity is a very much thinner size than 20 fluidity.

"I am glad you asked that question, because the whole business is all tied in together," continued Dr. Cathcart. "The majority of people who mix size, in my opinion, lose sight of one of the most important facts in mixing, and that is what I call the concentration of your size."

"What do you mean by the concentration?" asked Chairman Gibson.

"I mean the number of pounds or ounces that you have in a gallon of size when it is finished boiling and everything is ready for use," answered Dr. Cathcart. "I don't know whether you men do it or not, but lots of fellows say, when I ask them about sizing, 'Well, I measure out a hundred gallons of water, and then I put in my starch and compound and stir it and then I turn on the steam and boil it for an hour or an hour and a half or two hours, and then I take the size and keep a little steam on it to keep it hot until it is used up.' My first question is, 'How many gallons of size do you have in the kettle when you get the size finished?' and invariably almost the answer is, 'Oh, we don't pay any attention to that, because that is always the same.'

"That isn't true. The most important thing is to measure the size after you boil. Your concentration, the amount that is present in a gallon of finished size determines what is going on the yarn, and if you do not pay any attention to your concentration, the results will be all over the map and you will never be able to tell by looking what you get. If the water is colder at one time than another, the condensation that you get to boil will vary. Cold water will condense a good deal more steam than hot water. Variations in the steam supply will also cause a variation in concentration."

"Suppose you measure that you finish to 25 inches in the kettle, and when you finish you have 23 inches in there. You must fill that with water." Would cold water affect that or would it be better to use hot water?" This question was from Mr. Gibson.

"I was just coming to that point," said Dr. Cathcart. "The question I will answer as to how you are going to know this affects the concentration. The other way to get that is to start with an amount of water that is purposely too small or short of what you are going to finish with. We will say you use a concentration of one pound to the gallon. You want 100 gallons of finished size and want that to contain 100 pounds of starch. When you finish boiling you will have exactly 100 gallons because of a variable factor of condensation, you cannot always strike that, so start with an amount of water which, after boiling, will give you a little less than what you need and then fill the kettle to the required level after you have finished.

"It doesn't matter whether you put in cold water or hot water. If you have a hot water supply hot water is better, but if you haven't, you will get exactly the same result by putting in a few gallons of cold water and keeping the steam on and bringing it back to boiling.

"After you have done that, then you must not do any-

thing else that will change the concentration. There are only two ways of doing this correctly: One is to transfer the size to a storage kettle, if you have the circulating system, and have that storage kettle provided with a closed steam coil which will maintain the temperature without dilution, or have the size kettle provided with closed steam coil in addition to the open coil. This should also maintain the temperature here by circulating the steam through the closed coil."

Mr. Lockman asked if he put in size and boiled it and then added six gallons of water to make up his required amount what difference there would be in the size. Dr. Catheart explained that in starting with a smaller amount of water than would be required, the mixture could be kept under control throughout. He explained that the addition of five or six gallons of water at 60 or so degrees in a mass of 200 or more gallons of boiling water would have little effect upon the temperature of the whole and that it would require only a minute or two of steam to bring the whole business back to the boiling point.

Mr. Digby said as he got the idea it was that "if you put in a certain amount of water and cook the size to the degree you want it cooked and then add the water to give you the proper amount of density you want—if you put in your full amount of water to begin with in order to boil the starch as much as you want it, some days having wetter steam than other days you get too much water in the kettle and you cannot get it out."

"Exactly," said Dr. Catheart. "I don't know off hand what the percentage of increase is due to boiling. By that I mean this: suppose you put one hundred gallons of water in the size kettle and you stir in the starch and start boiling. After you have boiled one hour, if that is your boiling time, stop the boiling and measure it and see how many gallons you have. You will find that the hundred gallons of water without any starch now has increased due to the condensation of the steam, and with the delatinization of the starch, to a hundred and twenty-five gallons. That is what I refer to as the percentage of increase due to boiling, and that must be determined in order to get some sort of an idea as to how short your water must be so you will not have to add too much after the boiling operation is completed."

W. J. Britton, superintendent of the Spartan Mills, Spartanburg, said he has his kettles equipped with an overflow pipe 24 inches from the bottom of the kettle. Then the water is bound to run in to the proper level. "When we add size we have 188 gallons of water. When the batch is cooked we have 32¼ inches." Dr. Catheart said that gave a good percentage (33⅓%) which was all right provided the steam supply was uniform, the temperature was constant and the proper time of cooking maintained.

A man asked the question: at what temperature should we carry size in the storage kettle? "You should get the size as nearly as possible to the temperature you will use it in the size box. Professor Hinckley, formerly at New Bedford Textile School, made some investigations in one of the New England mills as to what temperature was most favorable in the size box, and his results showed that the temperature of the size in the size box should be 170 degrees Fahrenheit. Mr. MacNider, whom a great many of you knew, made some similar determinations in the South and his result was that a mill got the best results when the temperature in the size box was 190 to 192. It wouldn't be fair to say that either was right."

One man expressed it as his opinion that better penetration would be secured at the higher temperature. The mobility of the size is greater, it was pointed out, and the capillary attraction is influenced by the higher temperature.

This is a matter for the local mill to determine for itself, said Dr. Catheart.

"How long should we cook starch and at what temperature?" asked M. T. Grimes, of Anderson. "For corn starch the minimum period of actual boiling is 45 minutes," said Dr. Catheart, explaining that time had been established, "because if you make an examination under the microscope of a sample that has been boiled 45 minutes and then one boiled an hour and a half, there is practically no difference in the yarn under the microscope. The granules of starch are completely dissolved in 45 minutes."

Mr. Grimes asked about potato starch, which he is using, but Dr. Catheart said he was not in position to furnish authentic information on that as his experience has been with corn starch.

Mr. Chapman asked Dr. Catheart whether it made any difference to use hard or soft water in the size mixing.

"Of course, theoretically, distilled water is best to use," said Dr. Catheart, "and whether the water used will have an injurious effect will depend upon the amount of mineral salts in the water. Naturally, a water giving you scale in the boilers is not beneficial to use in sizing."

"Suppose it doesn't give you any scale?" asked Mr. Chapman.

"The result is this: you boil your size with water and all the salts in that water go with it into the size," answered Dr. Catheart. "It goes on the yarn, and then you pass the yarn over the drying cylinders, and anything in the water is then deposited on the yarn. Just as soon as the amount of minerals in the water is sufficient to affect the feel and strength of the yarn, then it is harmful."

Mr. McCombs explained a method of replenishing size after boiling which he uses, saying that he starts with less than he needs to finish with and then adds water. With recording instruments, he said, the change in temperature is observed to be not more than two degrees. Mr. McCombs also related an experience he had had with endeavoring to keep the temperature in the size vat at 170 degrees. He said he tried this, and put 50 warps through the slashers with 170 degrees in the size vat, but that he couldn't hardly get them through the looms. Then, he said, he went back to around 208 degrees.

L. T. Curry, of Lancaster, raised a question in connection with Dr. Catheart's recommendation to start with less water than was needed to finish with. Mr. Curry raised the question of whether the man without the circulating system would be able to do this as well as the man with one. Dr. Catheart explained that by keeping the stirrers going the time for the mixture to become homogeneous was negligible.

This concluded the discussion and the chairman introduced Paul Seydel, of the Seydel-Thomas Company, Atlanta, who made the following remarks on chemicals involved in the sizing process:

"Sizing is the most important process of the preliminary treatment of warps before weaving. Wheat flour, tallow and glue were the original sizing ingredients, bees wax was also very popular among some users. Wheat flour received a fermenting treatment which improved its weaving

and keeping qualities, the treatment is tedious, expensive and exceedingly wasteful and imparts to the mills and the goods very obnoxious odors.

"Later wheat flour was steeped in zinc salts which obviated the fermenting process. Many sizers, especially abroad, still hold that wheat flour has no equal for sizing purposes, especially to reduce shedding of heavy sizes. Of course much more heavy sizing is done abroad than is done in this country.

"Later the use of starch came about, corn starch, potato, sago, tapioca, wheat, rice, and even sweet potatoes have been used to give adhesive properties to the size; besides a number of dextrines and gums both of natural and synthetic origin. Notwithstanding the close relationship of the different starches they all produce slightly different results and have qualities all their own, some having higher penetration, others more body, some give a harsh stiff feeling, others a softer one.

"Sizing is used primarily to improve weaving; sizing also is greatly used, especially in Lancashire to increase the weight of grey goods, especially for export to India and China and with the use of the proper sizing compounds in addition to china-clay and other heavy materials, such as the sulphates of different metals it is possible to increase the weight of the warp up to 150 per cent.

"Before the war the demand for heavy sized goods had declined considerably, due possibly to the styles in India and China, but more probably to greater prosperity, the trade demanding better materials. In this section of the country the majority of sizing might well be called pure sizing. The main object being to improve weaving and impart to cloth certain physical qualities, such as fullness, softness, stiffness, etc., the slight addition in weight being merely incidental.

"A complete size should contain: fats and waxes; their object is to lubricate and penetrate the warp, to soften the size and yarn, to add to the flexibility, and to insure the ready separation of threads. One of the most common mistakes is to use too much fat, which produces soft warps, increases shedding, and reduces the tensile strength. The gums should be selected to impart to the size certain qualities of adhesiveness, strength, and body of which starch is deficient. There are many natural gums of considerable value, but the most economical and probably most efficient are produced chemically. The chemicals supplement the action of fats and gums; their functions are essential and it is impossible to obtain without them a size sufficiently strong or having qualities required to successfully resist the strain of automatic loom weaving, and they help when judiciously used, very considerably to increase production. Their main function is to so act on the flour or starch as to produce with it a colloidal film of the greatest possible tensile strength. They should have deliquescent properties so as to keep the warp sufficiently moist to obtain best weaving results. They should have permanent antiseptic qualities to preserve the warp and fabric against mildew.

"For preservatives and antiseptics zinc salts are among the best used. A number of organic substances such as carbolic, cresylic, salicylic acids; thymol, formaldehyde, etc., are of common use. Some have a disagreeable odor. Most of them are so volatile they have no lasting effect and the heat of the slasher drum and the steam carry off so much of it there is practically no protection left against mildew. For this reason they are of very little permanent value.

"More than anything else the chemicals are the main factors in transforming the flour and starch at will into a light, a medium, or a heavy, as well as an elastic and flexible, or a strong coating on the warp. They should be of such a nature as not to interfere with the subsequent treatment of the warp or cloth, and the problems of ultimate bleaching, finishing, storage, and some times long distance shipping should be well kept in mind when compounding a size mixture.

"The sizing and finishing specialist is the family doctor of the textile mill; when all goes well he is quite forgotten, but as soon as anything goes wrong he is called in for advice and when he succeeds in straightening out a weaving or finishing problem, he becomes a demigod for a few days until his services become a trifling event of the dim past.

"Nearly fifty years ago a Frenchman published a book concerning textiles, which has long been a classic. In fact, about nine-tenths or more of the literature on the subject has been copied from it. Although this is a very remarkable book it has failed in some of its predictions, among which that the mills would within a generation all make their own sizing or finishing compounds. This has been repeated in books published since. As a matter of fact, many mills have tried it, but very few have kept it up, and fewer mills today make their own sizing compounds than was the case a generation ago, and especially two generations ago, probably not one per cent today. This is an age of specialists and special problems are generally left to experts. The tallow and flour size of fifty years ago has been replaced by more up-to-date sizing with increased strength to resist the strain of automatic loom weaving and to take advantage of artificial humidity which has made even the finest weaving possible where the climate made it impossible some years ago.

"In the twenty years I have devoted to the study of chemical treatment of textile fibers, I have read books old and new, in German, French, English, and other languages on the subject, and it is remarkable how little the authors have originated—even the latest editions still have many superstitious beliefs. I have not found anywhere the proper interpretation of the theory of relativity concerning the different materials used in sizing and finishing. Most of them are so full of contradictions and statements not fully substantiated, that anyone reading them without the proper knowledge of what to believe and what to discard may get himself in considerable trouble.

I have long ago decided that a new book taking into consideration the latest knowledge should be written and I expect to do this as a crowning achievement of my career. I have accumulated a good deal of data, and some day I shall sort it out and come out in print, with the hope of giving some information on the subject that will be helpful to mill managements from the chemical standpoint.

In the literature at hand some products are advocated which are unnecessarily expensive and have no special virtue; others are tabood without discrimination that really are essential in some cases, and some of the finest and most useful ingredients that should be part of a good size are not even mentioned. It is a strange fact that although every book tries to teach the mill how to make their own

compounds, the more they try it, the more of them decide that compounds ready made by responsible firms are after all the best, the safest, and the most economical to use, and although not so very long ago most mills compounded their own sizing, today most of those who have tried it have given it up, even though they were fairly well satisfied, they found it did not pay any more than it pays a man to attempt to make his own shoes. This is not due to a lack of understanding, but to better understanding, and certainly the management of mills is no less, but more intelligent than ever before and recognizes the value of specialization. In the days before the automatic loom when tallow and flour with proper antiseptic treatment made a satisfactory size the specialists had little to do, but mills have learned that such problems must be left to specialists who not only furnish materials, but advise from time to time as problems needing careful and scientific attention come up."

Following Mr. Seydel's remarks, Chairman Gibson asked a question. "A good many of us," he said, "feel that calcium chloride is a very good chemical to use in sizing for good running weaving. However, we have our fear of using it because of the finishing afterward. How can we use it and at the same time not affect the goods in finishing?"

Mr. Seydel answered that Mr. Bean, from whose book Dr. Cathcart had previously read, advocates the use of the chlorides, and especially magnesium and zinc chlorides, for improved weaving. "The thing that seems to cause some fear in the minds of users of chloride is that in the process of singeing there may be a disassociation, of the magnesium chloride especially, and that it will cause a tendering of the warp. That has never been proved to me. I think that when the product is tendered it is more often due to singeing at too high a temperature. It is burned and it is easy enough to blame it on the chemical rather than carelessness.

"Used judiciously, and especially in the presence of a small amount of a strong basic salt, I think chlorides are quite safe.

"I might add that zinc chloride is a very powerful antiseptic besides being deliquescent." He said that zinc chloride does not present the attractive morsel of food for the mildew germ that glycerine does. He added that an antiseptic should be very permanent.

Mr. Franks asked why it was that some of the compounds would ruin his slasher blanket while others would not injure it. Even two different barrels of product from the same concern will have opposite effects on the blankets, he said. The cause for this seemed to be that the human factor enters into the manufacture of compounds just as into the manufacture of cloth, according to Mr. Franks.

Mr. McCombs asked, in view of Mr. Seydel's reference to the danger of glycerine in mildewing, whether three per cent would be excessive, and Mr. Seydel answered that in his opinion this amount would not be dangerous.

The morning session was brought to a close here and the men repaired to the Franklin Hotel, where a splendid luncheon was served. Enjoyable musical entertainment accompanied the meal.

The Afternoon Session

was opened at 2:30 o'clock at the Chamber of Commerce Hall with a short talk by E. A. Franks, superintendent Drayton Mill, Spartanburg, on the elimination of waste. Mr. Franks gave a number of suggestions for savings throughout succeeding processes in the mill.

At the warpers, he said, a great deal of waste is caused through section beams of uneven lengths. This he declared can be reduced considerably by the installation of registering devices on the machines in addition to the clocks on the measuring roll, providing a double check on the knock-off.

Many people, Mr. Franks said, make lots of expense for the mill because they do not try to keep size over from one day to the next. "It will keep," he said, "and you can run it the next morning." It will break down, he continued, but said that the way to overcome the weakening of the solution is to start a set with the immersion roll right at the top of the box, and to run it down into the size gradually until when the set is completed, it is at the bottom. This, he pointed out, provides a equal pressure on the yarn all the time, because as the roll is run down into the size, the yarn stays in it longer, which compensates for the size "breaking down."

Mr. Franks disapproved the idea of cushioning a roll and using blanket only on the outside. "I believe," he said, "that a blanket ought to be on enough to give it cushion and leave the yarn in a round state." He said, however, that blankets should not be left too long. Blankets should be taken out and washed over the week-end, he said.

At the front of the slasher, in a mill of 1,000 looms, 30s warp, two yards of waste off the slasher for each loom, running a warp every four weeks on a loom, results in a loss of $200 a month to the mill.

The tying-in machine man can through ordinary carelessness and in-attention add another $100 to that. Then in the weave room an additional $200 worth of waste is produced by not running the warps all the way out, and loss through bobbins on the floor, waste of loom supplies, etc., would bring the estimated total of average loss up to $7,000 a year, declared Mr. Franks. As to bobbins on the floor, he said, he has reduced his considerably by paying a premium of two cents an hour to those whose sections do not have a bobbin lying on the floor.

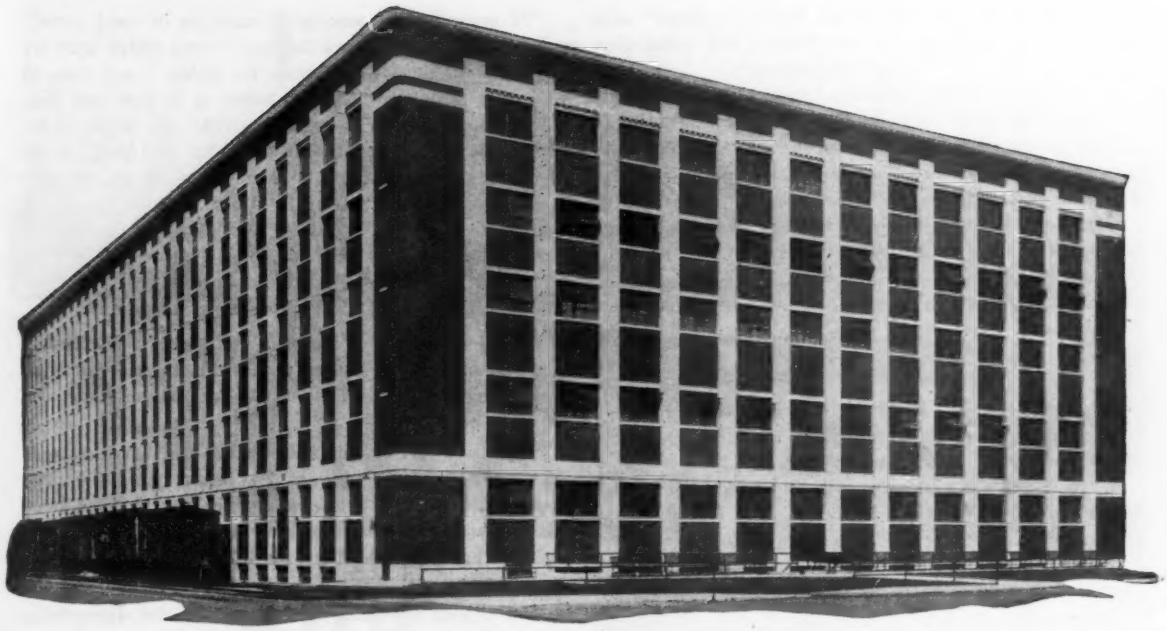
"A manly contract between the superintendent and overseer that they will not pass a bobbin on the floor is a mighty good thing," said Mr. Lockman, of Lockhart.

W. W. Cobb, superintendent, Norris Cotton Mills, Cateechee, S. C., asked Mr. Franks what he considered a good number of yards for a slasher blanket to produce a good cushion, and Mr. Franks said "six yards."

The next question asked by the chairman was as to the cost of a section of automatic looms on medium numbers, in loom supplies. W. P. Leister said that on a section of 100 looms, of different widths, his cost was between $40 and $80, not including reeds and harness, and that he had found the life of a shuttle to be less than 18 months.

B. R. Burnham, superintendent, Whitney Manufacturing Company, reported a cost of around $35, not including reeds, harness, crankshafts or belting. He said the life of a shuttle was around twelve months.

Mr. Britton brought out that if the shuttle account is kept down, the total loom supply bill will be reduced considerably He said that on 1,358 narrow looms and 1,100 40-inch looms, his shuttle life was 26 months, average. Mr. Gibson reported that from a number of mills reporting to the association, the average had been found to be 1.203 per loom per year. A report of .96 was given also.



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TRUSCON STEEL WINDOWS

"I have sections of 114 40-inch looms on prints," said Mr. Cobb, "and my cost is between $35 and $40, which does not include reeds and harness and belting."

J. J. Hyder, overseer weaving, Lanett Mill, West Point, Ga., raised the point that the life of the shuttle depends entirely on the class of goods being woven. At Lanett, he says, he has 60-loom sections, and that the supply cost, exclusive of reeds and harnesses, is around $32 per section.

Mr. Burnham read a report from the Draper Corporation on 100-loom sections, which showed the cost to be $43 per month, but stated he did not know whether the Draper Corporation charged in crank-shafts on this. These were 40-inch looms running 160 picks a minute. Mr. Franks stated that the speed of the loom would affect the supplies considerably.

Someone asked Mr. Britton how he increased the life of his shuttles and he said he did it by adjusting the looms and holding the fixers responsible.

"The life of our shuttles was increased from seven months to a year," said Mr. Burnham, "and I think it was due largely to educating the fixers to fix the looms properly, and then holding down the fixers in their supply account." He added they pay a premium to fixers whose costs do not go over a certain amount.

Shuttle life can be increased by changing picker sticks, reported Mr. Britton. He said he put in a heavier picker stick and increased the life of the shuttle 25 per cent.

Mr. McCombs told of some tests he had made in endeavoring to determine the least possible amount of waste a mill could get by with, and said he had found this to be .37 per cent.

The discussion here turned to the subject of the amount of starch being put in by the mills on an average. Mr. Gibson recalled that at a previous meeting it seemed to be around eight per cent, and he found by a show of hands that at the present the majority seem to be putting in more than that.

"In regard to the amount of moisture in sized yarns," said Dr. Cathcart, "I have frequently been called upon by mills to make this determination for them. I ask them to send me a sample of the yarn before it is sized and then off the same set after it has been sized. The moisture determination is made on the unsized yarn and then on the sized yarn. If the amount of moisture in the two samples is the same, or if the amount of moisture in the sized yarn is no more than in the unsized yarn, that is a positive indication that the yarn is over-dried. There should always be a slightly greater amount of moisture in the sized yarn. This determination is made by chemical analysis.

"I will say that in in a great many instances I have had to report back to the mills after these tests that they were over-drying the yarn. That is bad for the yarn and also for the size.

"We have carried this still further and have analyzed the cloth woven from this yarn, and in some cases the moisture content of the cloth has been higher than the total moisture content of the sized and unsized yarn, showing that moisture has been added by the humidifiers in the weave room."

Mr. Gibson explained that his reason for determining the per cent of size being put in was that harness manufacturers were claiming that additional size was the cause of shortened life of harness, rather than defective workmanship in the harness. Opinions differed on this at the meeting, and it was pointed out in addition to the fact that heavier size worked hardships on the harness, that excessive humidity would likewise affect it.

The meeting was adjourned at this point after an expression of thanks from Mr. Gibson, on behalf of the Association, to the Spartan Textile Club for their hospitality, and to C. C. Clark, C. D. Maigatter and Montgomery-Crawford, for the musical entertainment furnished at the luncheon.

What the Southern Mills Are Doing

Charlotte was the meeting place for the thirteenth annual convention of the Southern Wholesale Dry Goods Association, held from May 6th to 10th, and this fact presented an excellent opportunity to this important body of cotton-goods buyers to come into actual contact with the mills and the mill men. Advantage was taken of this feature, and visits made by the delegates to several mills in and around Charlotte. The Chadwick-Hoskins Co., Highland Park Mfg. Co., and Charlotte Knitting Mill plants in Charlotte were inspected, as were the Leaksville Woolen Mills.

Tuesday afternoon was given over to inspecting the Mays Mill and Mayflower Mills at Cramerton, N. C., on which occasion Stuart W. Cramer addressed the body on "What to Look for in the Manufacture of Cotton Goods." On Friday, the members were the guests of the Cannon Mfg. Co., at Kannapolis, and visited the towel mills there.

At the opening session, Mr. Cramer also addressed the convention in welcoming them on behalf of the cotton manufacturers. He urged the men to purchase southern materials, and pointed out in this connection the tendency toward further diversification and the inclination toward the finishing of the South's goods in the South.

In connection with the meeting, a number of southern mills and commission houses exhibited their products, and this was an interesting phase of the occasion. David Clark, of Charlotte, was in charge of the exhibit. Among the mills and commission houses who displayed their products and those they represented were:

American Yarn & Processing Co.; Riverside & Dan River Cotton Mills; Cannon Mfg. Co.; Cannon Mills; Stonecutter Mills; T. Holt Hayward Dept., Fredk. Vietor & Achelis; Highland Park Mfg. Co.; Brogon Mills; Chadwick-Hoskins Co.; Savona Mfg. Co.; Alexander Mfg. Co.; Catlin & Co.; Washington Mills; Charlotte Knitting Co.; Forest City Hosiery Co.; Catawba Knitting Co., Hesslein & Co.; James L. Wilson & Co.; Rosemary Mfg. Co.; Janet Garment Co.; Woodward, Baldwin & Co.; P. H. Hanes Knitting Co.; Lebanon Woolen Mills; Leaksville Woolen Mill; Northern Textile Co.; Joshua L. Baily & Co.; Cliffside Mills; Cone Export & Commission Co.; Wiscasett Mills Co., knitting dept.; Chatham Mfg. Co.; Turner Halsey Co.; Charlotte Duck Clothing Co.; Blue Bell Overall Co., and Icemorelee Cotton Mills.

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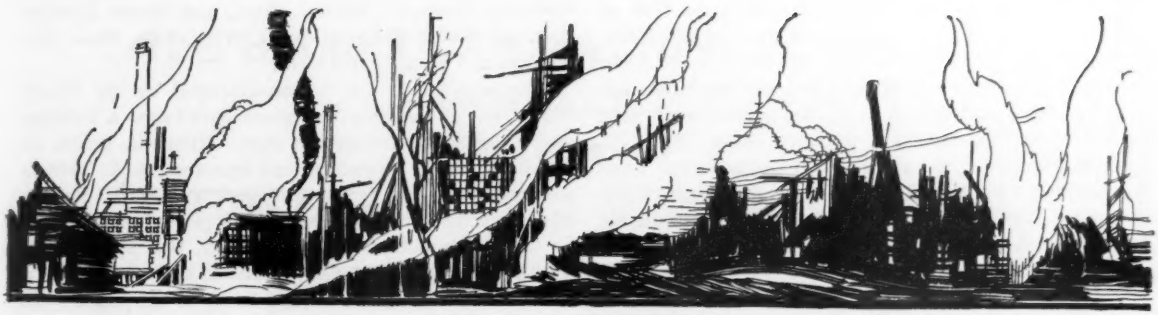
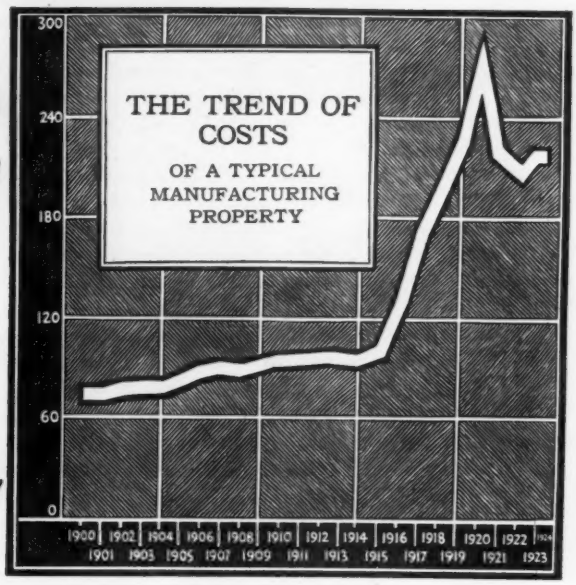
Another meeting of interest to southern mill men was



Fire and 1924



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that held by the Southern Textile Service Association at Columbia, S. C., on May 7th, 8th and 9th. M. W. Heiss, of Greensboro, N. C., was re-elected president; C. W. Coleman, of LaGrange, was re-elected first vice-president; Luther H. Hodges, of Spray, N. C., was made second vice-president, and Miss Florance Bushnell, Greenville, S. C., third vice-president. Mrs. Joe Wray, Gastonia, was elected secretary, with Miss Belle Fuller of Pacolet, S. C., as treasurer. These officers, with the following, constitute the executive committee: L. P. Hollis, Greenville; Mrs. Pearl Wyche, Greensboro; and Miss Rose Brimmer, Danville, Va.

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Construction items from southern mills were scarce during the past month in keeping with continued dullness in selling circles. A number of interest follow:

The Lancaster Cotton Mills have purchased from the Draper Corporation 300 looms to be installed in the new weave mill now under construction at Lancaster, which will utilize the product of the company's coarse yarn mills.

Lydia Cotton Mills, Clinton, S. C., have engaged Lockwood, Greene & Company, engineers, Atlanta and Boston, to supervise the installation of power and lighting equipment in their mill, as well in the new extension, which was designed and constructed under the supervision of this firm of engineers.

Cheraw Oil & Fertilizer Company, Cheraw, S. C., have purchased a two-unit waste system and 1,000 spindles from the Whitin Machine Works, to manufacture 2s to 6s yarn from linters and cotton waste.

Three vertical openers in tandem, and 14 cards, were recently installed at the Arcade Cotton Mills, Rock Hill, S. C.

Henrietta Mills, at Caroleen, N. C., are installing three vertical openers, one bale breaker, and the Nivling size system. They are doing considerable re-arranging in the picker room, and have covered all piping with Johns-Manville pipe covering.

Practically all machinery has been installed and operation started at the new plant of the Nelson Cotton Mills, at Whitnel, N. C. When completed, the mill will contain 6,000 spindles, and 26s to 30s ply combed yarns will be manufactured. J. L. Nelson, of Lenoir, N. C., is the president of the company.

The Caldwell Mills at Hudson, N. C., are rapidly nearing completion. It will have 6,000 spindles to manufacture 24s to 26s yarns.

Savona Cotton Mills, Charlotte, N. C., are erecting 10 four- and six-room dwellings in the village, at a cost of approximately $19,000.

The Brown Manufacturing Co. and the Norcott Mills Co., Concord, N. C., have under erection a recreation hall for employees, which will contain a gymnasium, auditorium and other features for special activities.

A swimming pool, 45 x 90 feet, is to be erected at the Erlanger Cotton Mills Company plant, Lexington, N. C. It will be of re-inforced concrete. Bath houses, pergola, wading pool, etc., will be added later. E. S. Draper, landscape architect and engineer, 11 East 5th St., Charlotte, has charge of the development, preparation of plans, etc. Contract has been let to E. H. Clement Company, Charlotte.

The addition to the Hannah Pickett Mills, Rockingham, N. C., will contain 800 looms from the Hopedale Manufacturing Company, Milford, Mass., and 38,000 spindles from the Whitin Machine Works, Whitinsville, Mass. The building will be 225 x 338 feet.

Cotton blankets will be manufactured by the Stuart Mills, Inc., at Danville, Va., which have leased a building and will install machinery at once. Milton G. Smith, of Greenville, S. C., is president and treasurer; S. A. Thompson, of Stuart, Va., is vice-president; and W. P. Barnes, of Leaksville, N. C., is secretary and general manager.

Gainesville Cotton Mills, Gainesville, Ga., have erected 16 six-room bungalows for operatives, and have added a new automatic waste cleaner and feeder in the picker room of the mill.

Robert & Company, Inc., Atlanta, were the engineers of the installation recently completed by the Opelika Mfg. Co., Opelika, Ala., of 18 new cards, one 60-spindle slubber and one 120-spindle intermediate. Ten cottages for operatives have also been erected.

O-Cedar Mills, Covington, Tenn., have installed 37 new Saco-Lowell cards, five slubbers and one Saco-Lowell spooler. The mill is being changed to individual electric drive, Westinghouse equipment being installed.

John S. Boyd, of the John S. Boyd Company, Williamston, Mass., has announced plans for the construction of a $1,000,000 plant at Johnson City, Tenn., for the manufacture of velvet for ladies' dress goods, corduroys, fustians, etc.

The National Shade Company, Memphis, Tenn., has been granted a charter with a capital of $25,000. The incorporators include W. P. Beard, J. L. Oliver, W. D. Harison, E. E. Parks and John Bruegge.

Union Bleachery and Finishing Company, Greenville, S. C., have purchased from the Cocker Machinery & Foundry Company, Gastonia, N. C., a seven-compartment piece dyeing machine with a three-roll padder; also a three-compartment washing machine and a single compartment demalting machine and twelve dyeing jiggers.

Construction work will start immediately on the first unit of the mill to be erected by Landau Brothers at McComb, Mass., for the manufacture of fancy cotton fabrics. W. Loeber Landau, of New York, and A. K. Landau, formerly of Magnolia, Miss., are interested.

Mills making installations of electric scrubbing equipment include the Crown Cotton Mills, Dalton, Ga., a No. 4 mop truck; Arcadia Mills, Spartanburg, a No. 2 and a No. 4 mop truck; Brookside Mills, Knoxville, Tenn., a No. 2 mop truck; and the Hudson Cotton Mills, Hudson, N. C., a No. 10 scrubber, an absorber to match, and a No. 2 mop truck.

Texas Textile Mills have been incorporated with a capital of $5,000,000, and plan to erect a string of mills in the Lone Star state, construction work on the first of which will begin soon. Robert & Company, Inc., Atlanta, Ga., are the engineers in charge. Mr. Robert states that the building will be 650 x 100 feet, two stories, to contain 25,000 spindles and a complement of weaving machinery. A village of 200 homes will be erected, with churches, schools, etc., and recreation parks will be developed. Heavy gray goods for converting trades will be manufactured. Interested in the project as incorporators are the following: Nathan Adams, president American Exchange National Bank, Dallas; Gus F. Taylor, president Citizens National Bank, Tyler; R. Bergfeld, vice president Citizens National Bank

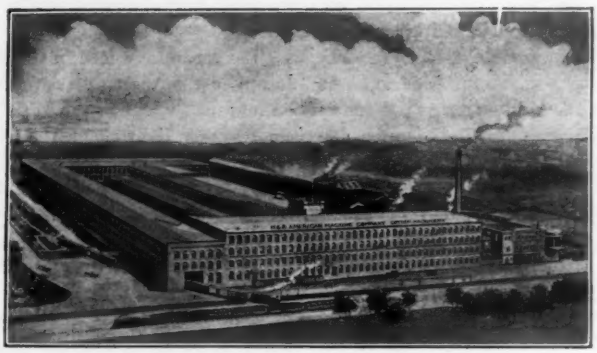
H & B AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

—BUILDERS OF—

COTTON PREPARATORY & SPINNING MACHINERY

FEEDERS
OPENERS
BREAKER
INTERMEDIATE
and FINISHER
LAPPERS



REVOLVING FLAT
CARDS
DRAWING FRAMES
SLUBBING
INTERMEDIATE
ROVING FRAMES

SPINNING FRAMES and TWISTERS
(Band or Tape Driven)

RINGS—FLUTED ROLLS SPINDLES—FLYERS

Southern Offices: 814-816 Atlanta Trust Co. Bldg., Atlanta, Ga.

and capitalist, Tyler; Joe B. Fortson, president Corsicana National Bank and farmer, Corsicana; J. W. Wright, capitalist, Dallas; M. L. Cannon, nationally known cotton mill executive, Charlotte, N. C.; J. H. McDonough, president Murray Company, Dallas; Lewis T. Carpenter, Lawyer, Dallas; L. W. Robert, Jr., nationally known textile engineer, Atlanta, Ga.; John W. Carpenter, vice president and general manager Texas Power and Light Company, Dallas; R. D. Johnson, treasurer Federal Land Bank, Houston; William Bacon, business man, Dallas; J. B. Earle, president Waco Twine Mills and president Liberty National Bank, Waco; C. B. Buxton of H. L. Edwards Company, cotton merchants, Dallas; Clinton C. Phelps, president Sherman Manufacturing Company, Sherman, and W. F. Pearson, Dallas.

The mill will operate on electric power, to be furnished by the Texas Power & Light Company.

The New England Mill Situation.

Depression in the textile industry is bearing heavily on New England. The silk and woolen mills are running short time, some of the carpet factories are nearly idle, and few of the yarn mills have been able to operate above 60 per cent capacity at any time this year. The cotton mills have been especially hard hit.

Relief is being sought in Congress, from the President, and from the Tariff Commission. Operatives in large centers like Fall River have been receiving assistance from welfare and fraternal organizations and the municipalities are now making preparations to provide work for idle men.

More than half the cotton mill spindles of New England are either running short time or stopped. Some centers, like Fall River, are not turning out more than a 30 per cent capacity production. There are five large mills in that center that have been stopped for months and are not likely to resume until a new cotton crop begins to move. They make print cloth yarn goods principally. During the past five weeks the depression has extended in a notable way to the fine combed goods mills and it is from them that the loudest complaints have been heard recently.

The large imports of British made cotton goods into this country which have been going on now for nearly two years have finally attracted attention, and relief through additional tariff protection is being sought. The operatives' unions started the ball rolling by petitioning the President for the application of the flexible tariff clause of the 1922 tariff bill to the situation. This part of the matter has been turned over to the Tariff Commission for investigation. The members of the Commission do not think they have money enough to make the investigation required.

Senator Walsh, of Massachusetts, a democrat, presented the situation to the Senate at some length, and it is expected that means will be supplied for an investigation. The President is sympathetic. The National Cotton Manufacturers' Association discussed the tariff situation as it applies to these imports, at the meeting held in Boston, and the National Council of Cotton Manufacturers has been asked to take the matter up. Stuart W. Cramer is chairman of this organization and he will present the matter to the convention of the American Cotton Manufacturers' Association to be held at Atlantic City. Southern fine

goods mills will join in the effort to secure any relief that is possible through political channels.

It is not believed that any very real government assistance will be forthcoming until late in the fall as it will take some time for the Tariff Commission to investigate and act. There is little or no hope that Congress will touch tariff matters at this season. It is too near adjournment and the subject is too contentious to take up seriously in a national campaign year. Meantime, some few manufacturers have begun to do something that might have been done at any time in the past two years, and that is to try to get down to a basis of competition with British mills.

One New Bedford mill recently accepted orders for 30,000 pieces of combed yarn fine poplins or broadcloths at one cent a yard under the British landing price. When it booked all the business sought it advanced the price one cent to 22½ cents a yard. Other mills would not meet the price. But some mills have been taking more of this business recently and they have been paying particular attention to the fine venetian and fine sateen business on which competition is within reach, if the domestic mills care to work without present profit. One very great obstacle has been the disclosure that shirt manufacturers find they can sell shirts better when there is an imported mark in the neckband, the assumption being that the public wants the imported material first.

This disclosure was one of the things that led to a discussion at the recent manufacturers' convention favoring the use of a name, such as "Made in New England" to distinguish the place of origin. This proposition was not thought feasible as it tended to sectionalize United States textiles. Some mills, like the Boott of Lowell, use a trademark designation, "Made by the Boott mills, Lowell, Mass., U. S. A." and other mills rely upon their regular trademark, such as Amoskeag, Pepperrel, etc.

There is much more to the competition of English goods than the place of origin. Most of the goods that have been coming in so freely were made of Egyptian cotton. English mills use this cotton very largely and there are many grades handled there in the mixings that rarely reach this country. When spun on mules, as most of the cotton is in England, and woven so that the soft spun yarn is lifted to the surface of the cloth, the finishing possibilities are very great, and many of the English cloths lend themselves to a luster that is not so readily obtainable on American made goods. Moreover, a great many of the cloths are finished in this country and distributed through converters, who are purely handlers of merchandise and are not particularly interested in whether it is made in the United States or Khamchatka.

The influx of more than four times the usual volume of fine cottons into this country from abroad, was bound to demoralize the domestic industry, but until trade here became very poor, manufacturers paid little attention to what had been going on. They were content to allow the goods to come in without protest, so long as they could secure profitable business in other directions. Now that these foreign cloths are being used for shirts, blouses, and dress materials, to say nothing of the millions of yards going into lingerie, the strength of the competition is fully recognized.

New England's troubles are attracting wide-spread attention and much unintelligent comment. The South's growth is blamed for a great part of the bad New England situation, but there is far more than the South involved. The Fall River operatives demanded and secured an advance in wages a year ago at a time when it was clear to most far-seeing cotton manufacturers that hard times for cotton mills were in sight because of cotton scarcity, and other things that were making goods relatively high in price. While cotton has gone to 37 cents a pound this year, the great volume of cloth output sold by the mills has been predicated on cotton values at 30 cents a pound or lower. Of this there is less doubt now than there was when the first statement of the kind was made last December.

The general comment made about cloth prices looks upon cotton cost as the only factor involved, when, as indicated, an unusually high wage scale was created to complicate cloth sales. Then again, the situation in Fall River, which is merely typical of other New England centers, was complicated by the imposition of the highest municipal taxes on industry conceivable. A million dollar print cloth mill in that city, now idle, although well equipped, is taxed $77,000 annually by the city. In other words, the mill must earn 7.7 per cent on its capital before it begins to think of other things, such as profit taxes, state taxes, or indeed many other costs, for the municipal tax lien is a prior lien. This huge taxation has been brought about in great part by extraordinary municipal expenditures, for schools, automobile roads, and very high wages paid to city laborers who work short hours. These things are all right, perhaps, but they cost money that comes out of mills in competition with other concerns paying less than one quarter of this tax.

Still another thing is that mills in Massachusetts run but 48 hours weekly, and by agreement, that had been applying in New Hampshire until a short time ago. In Rhode Island, despite all the bad times, and with half the mills there in idleness, the legislature has passed a 48-hour bill. It is this oppressive legislation that is crippling New England more than tariffs or southern competition.

From time to time, labor agitators working in the New England cities send out statements of how the South is being organized, what is sure to happen there to increase comparative costs in the near future. Manufacturers take little stock in this sort of talk. Many of them are investing in the South because of its manifest advantages for certain lines of work in textiles, and it may very well be assumed that they will not commit the blunders made in New England of permitting all sorts of legislative and communistic restrictions on industry being imposed there without a protest that will emanate from the workers as well as from the investors in mills.

The finishing plants of New England have been continuing short time operations. An average of the operations showed recently that less than 60 per cent of the capacity is employed. The large bleacheries are running about three days a week, and the print works from 50 to 70 per cent total capacity. Most managers do not now look for better conditions within 60 days at least.

The mill machinery concerns are averaging about 60 per cent capacity operations, and some are doing much less. Some of the machinery concerns are spending more than the usual amount of money in research operations. There is an increasing pressure being brought to bear by manufacturers for the evolution of new and more economical methods in various departments. It is stated, though not

yet fully confirmed, that within a year some twisting machinery will be in use that will reduce present costs 40 per cent, brought about primarily by higher speeds and entirely new mechanical appliances.

There is nothing in the trade situation that gives much promise of improvement until more is known of the new cotton crop, and until the political campaigns are shaped up. At the moment, Washington conditions are making cotton manufacturers heartsick.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, May 16th, 1924.

While there has been no improvement of consequence, if at all, in the domestic textile trade situation, there has been a betterment in textile trade conditions abroad; the one serving to offset the other, consequently the market has ruled comparatively steady, values of today showing but little change compared with one month ago.

American mill takings and domestic mill consumption remain small compared with this time last year, but during the past month exports of raw cotton to Europe, and foreign spinners takings of American cotton have exceeded exports and European mill takings of one year ago.

The continuance of large exports from the United States are not reflected in much of a shrinkage as yet in the stock at all ports, which are now 399,000 bales vs. 406,000 last year, but they have been at the expense of invisible interior holdings, to such an extent that there remains to be marketed in the South only about one-half as much as was on hand in the country at this time one year ago, or only about 863,000 bales vs. 1,640,000.

As a matter of fact, of last year's total crop, including linters, which was about 10,800,000 bales, 10,546,000 bales have been marketed, and it will likely be only a few weeks when the trade will be drawing against the very small surplus that was carried over in the interior at the close of last season, at which time the scarcity of raw cotton in the South will probably become more apparent.

CENSUS REPORT.

United States—	This Season	Last Season
Consumption, April, includ'g linters.	522,299	629,109
Consumption, 9 mo., includ'g linters	4,968,346	5,536,714
Mill stocks April 30th	1,328,273	1,878,198
Stocks in public storage Apr. 30	1,512,086	1,965,714
Total stock U. S. Apr. 30	2,840,359	3,843,912
Active spindles Apr. 30	31,871,665	35,512,738

During April, American mill stocks decreased 170,000 bales vs. 155,000 last year, and the total stock in the United States decreased 641,000 vs. 570,000 notwithstanding domestic mill curtailment. The large decrease being due to the large exports from this country.

The following comparatives show how readily Europe has been taking American raw cotton this season; the high prices notwithstanding:

EXPORTS FROM THE UNITED STATES, AUG. 1 TO APRIL 30.

To—	This Season	Last Season
United Kingdom	1,538,067	1,230,801
France	634,935	572,364
Italy	475,606	441,625
Germany	1,075,379	761,971
Other Europe	603,332	573,084
Japan	513,392	529,520
All other countries	162,420	207,974
Total, 9 months	5,003,131	4,317,339

SPINNERS TAKINGS, AUG. 1 TO MAY 16.

American Cotton—	This Season	Last Season
North and Canada	1,580,000	2,326,000
South	3,569,000	3,909,000
Europe	4,653,000	4,606,000
World	9,802,000	10,841,000

WORLD'S VISIBLE SUPPLY.

May 16—	This Year	Last Year
American cotton	1,582,000	1,495,000
Other kinds	1,644,000	1,586,000
Total of all kinds	3,226,000	3,081,000

In view of the smallness of the world's visible supply, not only of American, but of all kinds, and the small quantity remaining to be marketed in the South, the need of a large crop for next season is self evident, at least 12,500,000 vs. last year's crop of about 10,800,000 including linters.

As to the new crop, present prospects are not any too encouraging owing to unusually cool weather throughout the cotton region this month, which has retarded germination of the late planted, necessitated much replanting of the early seedings, and checked the growth of young cotton. The damage is not irreparable, however, if good weather is obtained in the future.

Private advices indicate an average increase in the acreage this year of about four per cent, and an increase in the fertilizer of about 10 per cent.

The future of the market and progress of the new crop will probably depend mainly upon future climatic conditions in the cotton region, which will make or mar the size of the crop.

The Dodge Manufacturing Corporation, of Mishawaka, Indiana, announce the manufacture of a new iron center wood rim motor pulley. This pulley embodies the same principles of wood pulley construction that are embodied in the Dodge wood split pulley and is a development of the Dodge idea of compression fastening and interchangeability of bushing to the shaft that has proved successful with the Dodge standard iron split pulley and the Oneida steel split pulley.

There are two principal parts, the slit iron hub and the wood rim. The hub comprises a slit bushing, two wedge rings and three or more fillister head machine screws, according to the size of the hub. The wood rim is made of select stock, laid up in segments and glued under heavy pressure. A seamless steel tube is forced into the wood rim and securely interlocked. This tube supports the rim and drives it through frictional contact with the wedge rings on the slit iron bushing.

The pulley is easily applied and by tightening the screws, gradually and uniformly, it is securely fastened. Removal is as easily accomplished and a screw driver is the only tool required for both installation and removal. There are no set screws or keyways.

Notes About Men You Know.

W. D. ANDERSON, president of the Bibb Manufacturing Company, has been elected president of the Macon, Ga., Rotary Club.

MARSHALL P. ORR, formerly secretary and assistant treasurer of the Orr Cotton Mills, Anderson, S. C., was recently elected president and treasurer of the mill succeeding the late James D. Hammett.

LAWRENCE O. HAMMETT, son of the late Mr. Hammett, was chosen as president of the Chiquola Manufacturing Company, which position had been held by his father.

GEORGE P. HAMMETT was elected secretary and assistant treasurer of the Orr Cotton Mill, and J. E. Sirrine, of Greenville, was made vice-president.

H. D. TOWSEND, overseer of carding at the Erlanger Cotton Mills Company, Lexington, N. C., has received the Democratic nomination for State Senator from Davidson County. Mr. Townsend previously served in the lower house of the state legislature with a splendid record.

W. A. BROOKS, who has been superintendent of the Georgia Mills Nos. 1 and 2, Griffin, Ga., for the past three years, is now also superintendent of Mill No. 5, which was formerly Kincaid Mill No. 2. The merged concern is known as the Georgia-Kincaid Mills.

W. P. CARGILL has resigned as general superintendent of the American Cotton Mills, Bessemer City, N. C.

ALLEN D. KEYSER has accepted the position of superintendent at the Priscilla Spinning Company, Gastonia, N. C. He was formerly assistant general manager at the John Farnum Company, Philadelphia, Pa.

JAMES J. LEVER has been promoted from second hand in spooling to overseer of spinning and spooling at the Olympia Mill, Pacific Mills, Columbia, S. C.

WARREN H. PEARMAN, overseer of spinning at the Princeton plant of the James White Mills, Athens, Ga., has been made general overseer of spinning, spooling and twisting.

JOSEPH H. SHINN, formerly manager of the Philadelphia branch of the U. S. Testing Company, and more recently in charge of the research and investigation department of the company's New York laboratories, has become associated with the Tubize Artificial Silk Company of America, and is a part of their organization at 303 Fifth Avenue, New York City. Mr. Shinn has had an extensive experience as a textile expert covering many lines of textiles, especially those employing artificial silk alone and in combination with other textile fibers. The Tubize company announces that this is but another link in the chain of service it is endeavoring to extend, and Mr. Shinn's association with them better equips them for solving manufacturing problems relating to their product.

A. C. REVELS, formerly superintendent of the Morven Cotton Mills, Inc., Durham, N. C., has become superintendent of the new mill to be erected at Cheraw, S. C., by the Cheraw Oil & Fertilizer Company.

A. B. YUILL is now representing the Oxweld Acetylene Company with headquarters in Charlotte, succeeding L. G. Buckle, who was recently transferred to the Pittsburgh district.

J. B. GAMBRELL has resigned his position in the office of The Trion Company, Trion, Ga., to become Georgia and Alabama representative of Stein, Hall & Company, of New York. Mr. Gambrell is a son of J. C. Gambrell, assistant treasurer of the Ware Shoals (S. C.) Manufacturing Company. In his new position his headquarters will be in Atlanta.

B. R. DICKSON has been promoted to the position of superintendent of the Greenwood Cotton Mills, Greenwood, S. C., as successor to J. B. Harris, who was named vice-president some months ago. Mr. Dickson has been assistant superintendent for several months and prior to that time was overseer of carding.

A. C. CANTERBERRY, overseer of spinning at the Eva Jane Mill of the Avondale Mills, Sylacauga, Ala., was stricken with paralysis on Sunday, May 11, and died almost immediately. He had held this position about three years, having formerly been superintendent of the Alden Mills at Meridian, Miss.

Mr. Canterberry, besides being a good mill man, was particularly interested in the work of the Boy Scouts. He is survived by his widow, one daughter and four sons.

O. C. RADFORD has been appointed manager of the Atlanta branch of the Graton & Knight Mfg. Co., manufacturers of leather belting and other leather products. Mr. Radford has been with this concern for several years, and up to the time of his transfer to the Atlanta district, he was branch manager at New Orleans. He will make his home in Atlanta and will have charge of all sales in the Carolinas, Florida, Alabama, Georgia and sections of Tennessee and Mississippi. M. J. Kennedy is to cover the South Carolina territory for the Graton & Knight Mfg. Co. He has been with Graton & Knight for four years and has worked both at the main factory and at the Atlanta branch of this company.

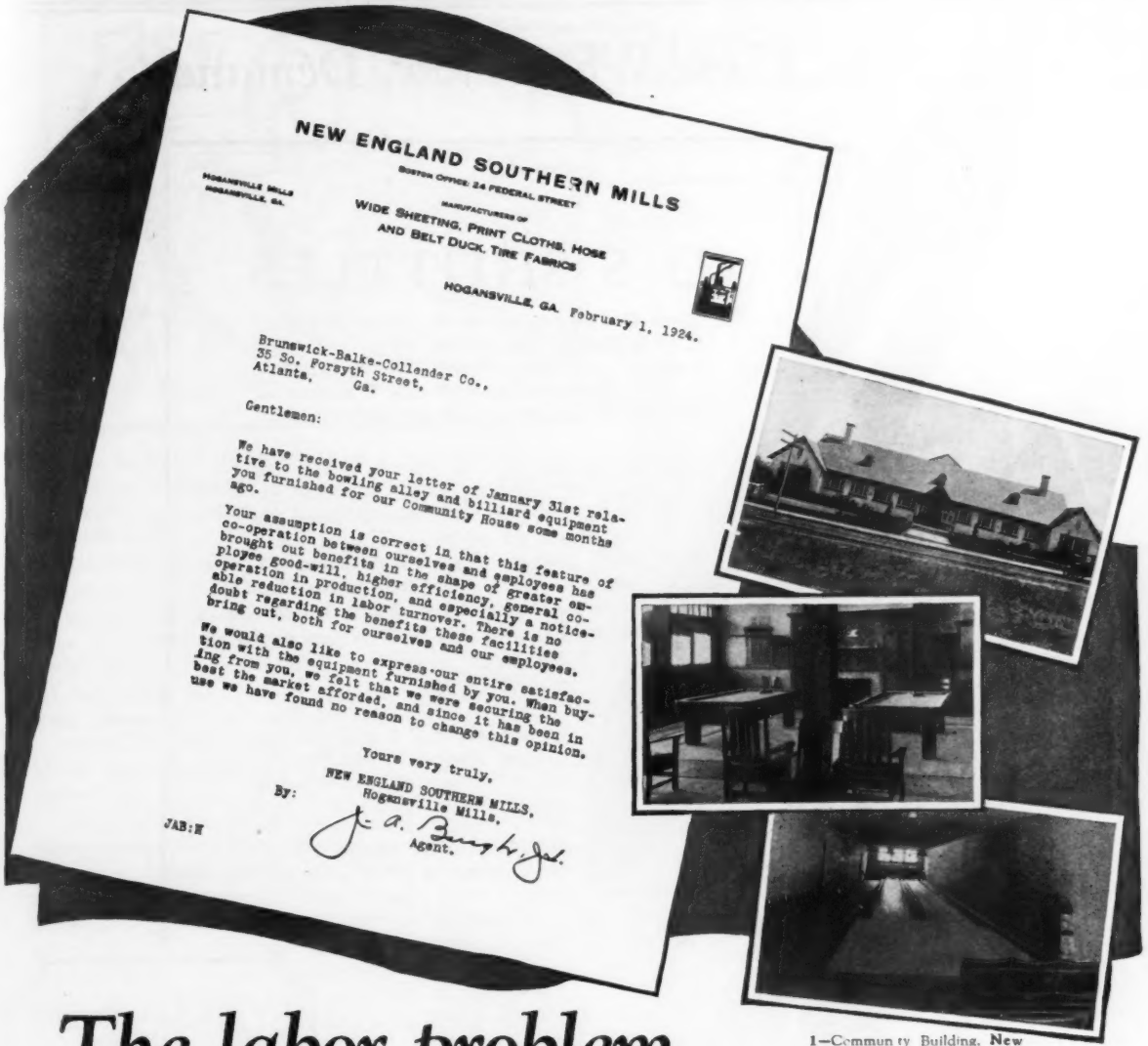
C. O. DRAYTON, assistant sales manager of the Graton & Knight Mfg. Co., has been South on an extensive business trip.

J. M. MERROW, president of the Merrow Machine Company, Hartford, Conn., manufacturers of the Merrow high speed overseaming, overedging and shell stitch machines, has recently returned from Europe completing an extended trip on which he combined business and pleasure. Mr. Merrow's itinerary included a visit to several of the company's sales distributors in England and on the continent. His special mission was to study business conditions in these countries first hand, which he had an opportunity to do in several of the principal commercial centers.

CHARLES C. FAGAN has been made superintendent of night work at the Standard-Coosa-Thatcher Company's Coosa Plant, Piedmont, Ala.

JOHN D. MCCAULEY will have charge of all the spinning at the Coosa Plant of the Standard-Coosa-Thatcher Company, Piedmont, Ala.

CARL R. HARRIS has become assistant superintendent of the Inman Mills, at Inman, S. C. Mr. Harris, who is Chairman of the Spinning Division of the Southern Textile Association, has for several years been night superintendent at the Lancaster Cotton Mills, Lancaster, S. C.



NEW ENGLAND SOUTHERN MILLS

HOGANSVILLE MILLS
HOGANSVILLE, GA.

BOSTON OFFICE: 24 FEDERAL STREET

MANUFACTURERS OF
WIDE SHEETING, PRINT CLOTHS, HOSE
AND BELT DUCK, TIRE FABRICS

HOGANSVILLE, GA. February 1, 1924.

Brunswick-Balke-Collender Co.,
35 So. Forsyth Street,
Atlanta, Ga.

Gentlemen:

We have received your letter of January 31st relative to the bowling alley and billiard equipment you furnished for our Community House some months ago.

Your assumption is correct in that this feature of co-operation between ourselves and employees has brought out benefits in the shape of greater employee good-will, higher efficiency, general co-operation in production, and especially a noticeable reduction in labor turnover. There is no doubt regarding the benefits these facilities bring out, both for ourselves and our employees.

We would also like to express our entire satisfaction with the equipment furnished by you. When buying from you, we felt that we were securing the best the market afforded, and since it has been in use we have found no reason to change this opinion.

Yours very truly,
NEW ENGLAND SOUTHERN MILLS,
By: Hogansville Mills,
J. A. Burghard
Agent.

JAB:H

The labor problem

1—Community Building, New England Southern Mills, Hogansville, Ga.

2—A corner of the billiard room in this building, and

3—The bowling equipment.

TO AVOID every form of labor difficulty; to keep workers from becoming restless; to keep them happy, contented and loyal are factors of management that constitute a knotty problem in industrial centers.

How billiards and bowling helped the New England Southern Mills to work out a solution of this problem for their employees at their Hogansville, Georgia, Mill, is shown by the letter and views illustrated above.

As makers of the world's finest billiard and bowling equipment, The Brunswick-Balke-Collender Company has furnished the equipment used in the country's most successful industrial welfare associations. The knowledge and experience thus gained is at the disposal of anyone interested in this means of effecting a closer relationship between employer and employee.

The BRUNSWICK-BALKE-COLLENDER *Company*
Branch houses in the principal cities in the United States and Canada
623-633 South Wabash Avenue, CHICAGO

Request for information

The Brunswick-Balke-Collender Co.
623-33 So. Wabash Ave.
Chicago, Ill.

Without obligating us, please send information regarding the use of Brunswick equipment as a means of bringing about a closer relationship between employer and employee. We are particularly interested in:

☐ ***Billiard equipment***
☐ ***Bowling equipment***

Individual _____

Firm Name _____

Address _____

Those Who Know, Demand

U S SHUTTLES

Where fine textiles are made; where uniformity of product is the watchword, where economical productio nis required; where the utmost in shuttle service is demanded—you will find U S Shuttles. The user of U S Shuttles expects service and he gets it.

The "S Eye Automatic Shuttle" is one of the famous U S products that has convinced the most doubtful that it is the best automatic shuttle made for all kinds of looms. Simplicity and ease in positive threading, uniform tension, freedom from unthreading, mispicks and broken picks are a few good reasons why a weaver of first quality can afford to use no other. In the weaving of high grade fabrics shuttle uniformity is a necessity.

Another famous U S product is the "Stetson" Hand-threading Shuttle—the best exponent of hand threading type of shuttle that has ever been put on a loom. U S Shuttles are made in types for Draper, Stafford and Crompton & Knowles Looms.

Do you wish to see samples? If so write us.

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Cotton
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U S BOBBIN & SHUTTLE Co.

Eight Factories

LARGEST BOBBIN and SHUTTLE MANUFACTURERS in the WORLD

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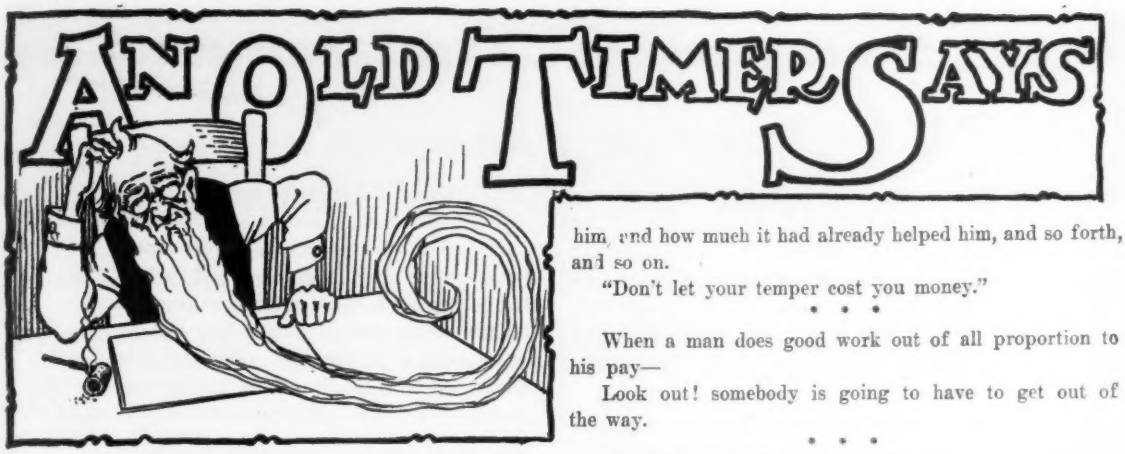

"Nature makes the man." Yes, I suppose that is a fact. Anyway, some big man said it, and as nobody knows how to put up much of an argument against it, we'll just accept it as a fact.

But after nature has made the man, it is up to the man to make something out of himself.

If a man doesn't take charge of himself and study his weak points and his strong points, just like you should study one of your second-hands or overseers when you are prospecting for a man to promote—I say if you don't study *yourself,* you are not going to progress very fast.

You so often hear it said, "Oh, yes, he has his faults like all the rest of us, but he is a good overseer, or superintendent," etc.

Now that is just the point. Most all of us have some little contemptible weakness which goes a long way toward offsetting our good qualities, and the sad part of it, I am sorry to say, is that many of us actually know of these things, but never stop to realize how easy it would be to get rid of them if we would only make a start.

Don't forget, brother, that if you try hard enough, you can overcome those weaknesses; and what a satisfaction it is to a man when he has accomplished anything along the line of improving himself!

It gives you so much more confidence in yourself. The first thing you know you begin to realize that you are a *man* and that you have a strong will power, and that you can use that will power to make money for you. Yes, that is just the point I was gradually leading up to—it all boils down to the fact that money, position, honor and pleasure is what we are all working for.

I accidentally—that is, without thinking—made the following remark to a friend of mine one day when I was trying to give him some advice about the work he was doing; I said, "Don't ever let your temper cost you money."

Did you ever think of it in just that way, my good friend? Stop now and think back over your past life, and see if you can really figure up just how much money your temper has cost you. Sure!—get out your pencil and actually put it right down in black and white. That is the only way to realize what a big fool you have been.

In fact, I did not think much about what I had said to this friend until some time later I saw him, and I thought he was going to hug me right there on the street, and then he began to tell me what a wonderful thought I had given him, and how much it had already helped him, and so forth, and so on.

"Don't let your temper cost you money."

* * *

When a man does good work out of all proportion to his pay—

Look out! somebody is going to have to get out of the way.

* * *

New Year's resolutions are fine—

But NOW is the time for you to make your start toward improving yourself by some kind of systematic study—

If you haven't anything right handy to start studying, begin on yourself. There are many things about you that you can improve on. For example, you are—well, never mind, I'll not expose you by telling all of COTTON's readers about it, but you know where there is some room for improvement, don't you?

There now, you have actually admitted it before you read this far.

Then why in the dickens don't you make a start?

* * *

Remember what "Old-Timer" told you about a mule in an article some time ago? Well, anyway, I don't want you to forget it.

Did you ever see a mule *pulling* and *kicking* at the same time?

Impossible.

And an overseer can't do it, either.

* * *

"Tall oaks from little acorns grow," but no man will ever hold a big job and command a large salary unless he can get to be broad-minded; lend an attentive ear to the experience of others; make earnest endeavor to interpret and carry out his superior's orders; and, above all, not forget that there are a few others that probably know as much as he does.

* * *

When you give your orders to your section men to do something that you know they really don't want to do, don't you admire the fellow who goes at the job wholeheartedly, like it was almost a pleasure? Well, now, how do you go at carrying out those same kind of orders for your superintendent?

* * *

Strange, but after a man has had several jobs he generally settles down on the size job which compares with his ability. Have you settled? If you have, remember that a man can practically make himself over by constant application and study. Come out of it!

* * *

A friend of mine was recently talking to me very enthusiastically about installing humidifiers over his picker hoppers. Don't forget that damp cotton does not clean as well as dry cotton.

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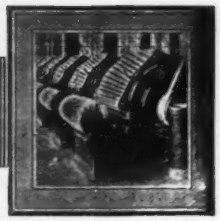

Spinning Room Questions for Discussion.

EDITOR COTTON:

I am sending several questions that might be interestingly discussed in COTTON if the men will take them up.

What do you find to be the result of using rings which have been turned over?

Which do you prefer, No. 1 or No. 2 flange rings, and why?

Have you ever used top-rolls covered with any other substance than leather; if so, how do they compare with leater-covered rolls?

On the filling, do you run the rail up slow and down fast, or vice versa? Which do you prefer, and why?

For warp spinning, how does filling wind compare with regular warp wind?

What is the best method of conditioning filling before weaving?

What are the advantages or disadvantages of the centrifugal clutch spindle?

Which are better, round point or square point travelers?

These questions all apply to the spinning room. I hope we can have some good discussion on them.

G. E. M. (Mass.)

Cooperation in the Mill.

EDITOR COTTON:

In "Old-Timer's" article in April COTTON, one point particularly interested me, and that was, "Why goodness, man! your help is your audience, and they are ready to applaud you in a thousand ways."

My point is, do overseers cooperate with second hands, third hands and section men? An overseer is supposed to know all about the work he supervises. Does he let his second hand know the inside workings of the room as to figuring costs, pay rolls, etc.? Does he take his second hand into these details that he should know before he is capable of taking an overseer's position? Does he take him into his confidence and get his opinion in regard to changes in the room? In short, does he and the second hand get together and work hand in hand?

As a general rule, I believe the majority do not. Some overseer's things have to be done the way *they* think. Sometimes a second hand will make a suggestion, but it is pooh-poohed. There is often a sort of jealous feeling that exists in the mind of the overseer, who fears that the man underneath, if he gets to know too much, might step up into his shoes.

And does the second hand always let the third hand know some details that are essential for him to know before he can seek promotion? Take for instance a third hand who is "stuck" and doesn't know how to fix a certain thing on a machine. He naturally seeks the second hand. Now does the second hand have the patience to go into every detail and show the man underneath the cause and the remedy? The majority will say, "Reach me them wrenches," and will fix the machine without explaining to the third hand, who is no wiser. Another case of jealousy.

I know whereof I write, I have been in that boat.

Would it not be far better if these men would get together and advise and teach the men who are not as far advanced as themselves? I am sure it would be a pleasure to work in a room where that feeling existed among the men. As "Old-Timer" says, the work would be a pleasure. Some men, as soon as they get a promotion, walk around the mill with a sour look and find fault at the most trivial things, instead of giving a word of encouragement to the help. But let me say here that I realize there are some people who impose on kindness, but they don't usually stay very long at any mill. But let an overseer go around the room and say "Good morning" to the help and treat his second and third hands well and teach the man underneath the things he does not know, then who is there in that room who will not do his or her utmost for that man? Take my case as an instance. I was third hand in a mill and the overseer was a very capable man and knew his job, but he was a very hard man to work for. He wanted us to be working all day long and when he was teaching me how to fix he would yell at me and bang the wrenches on the floor. I asked him one day why he shouted at me and he said, "When you or anyone else who works for me and decides to leave and get a better position, I want him to be able to do his job in a way that will be a credit to me." I am today thankful to that man for what he taught me, but I would have preferred getting my teaching in a milder manner.

It is a credit to any man to have another say, "I thank Mr. So-and-so for all I know and for helping me along." Let us have more cooperation in the mills and we will turn out more capable men and we will be doing justice not only to ourselves, but also to the man underneath, because these men help to keep the position of the man over them. Some men say, "I had to dig; let them dig," but I think

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Some day you'll need this man

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we would get more pleasure out of it by helping them to "dig." Riverside (Mass.)

A Carder Comments and Questions.

EDITOR COTTON:

I have decided it is about time to write again, afraid if I delay longer that the tired feeling making me lazy may get hold of me as it usually does every Spring. I surely have enjoyed reading the articles as presented so regularly in COTTON and am convinced that COTTON is reaching a great many men who are interested in their work and looking for improvements. It is very interesting to note the various opinions now expressed on subjects that formerly were taken for granted. I think that the section "How Other Men Manage" has broadened out mostly because men have time to think before expressing themselves. I know in my talks with other mill men they sometimes seem afraid to let themselves go, possibly afraid that their meaning will be misunderstood. But here in the discussion department they have time to think the points over carefully and put their thoughts into words that can be interpreted correctly.

Of course it is natural that we do not all agree upon the same points, if we did there would be no need of having high salaried men to run the mills, one man could lay out the course and nothing would be easier if all were doing things the same, but it is this difference of opinion that makes life interesting and keeps us all looking for something better, it is also the incentive that keeps us digging for improvement in our work, because we must do as well as our neighbor and the owners of our mills always expect that we do better. If we expect to reach the top we must always keep climbing for the moment we stop somebody is ready to pass us and after once getting ahead of us they work harder to keep there and we must increase our endeavor much more than they, for it is harder to make up ground lost than to keep what we have and gain a little more.

When I read the first fable, "Not by Aesop," I was very much disappointed and couldn't understand why Mr. Arnold should allow such writings to be published; I thought he was going back. When my next number came I found another article by the same writer and at first decided not to waste time reading it. But as I began to think about the magazine, I decided that it must have impressed the Editor favorably and would do no harm to read it, so I started and read about one-quarter down and all at once I saw the light and started at the beginning again and read it with thought. Then I got my previous copy and read the article there with thought. Now I look for them each month. I think that they, being so different from anything I had perviously seen in such a magazine, led me astray. The points that are here brought out are applicable to all and are told in such a way that the lesson can be applied right at home—*the other fellow's faults are brought out clearly.*

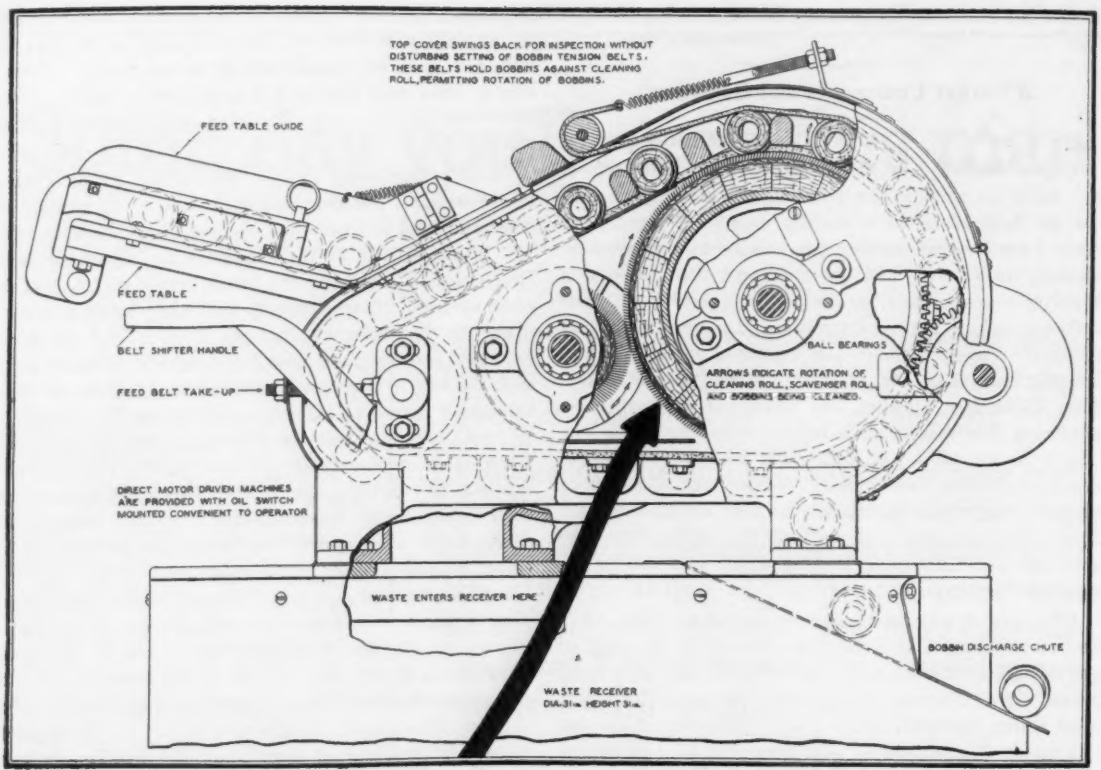
I noticed in reading in the January number the lecture of Mr. McDowell before the Fall River operating executives, he speaks of cutting out one-third of the machines in the mill and making as good or even better yarns. Has this been tried anywhere? Say on 28s or 30s yarn. The only machines I have heard or read of eliminating are one process in the picker room or one process of draw frames. In most all cases where this has been tried on 30s yarn the mills have gone back again to their former layout. I would like to know why they find it necessary to do this. Possibly some of your readers can give some information along this line.

I have thoroughly enjoyed the reading of the reports on the sectional meetings held in the South. In reading the discussion held at Charlotte, reported in the January issue, Mr. Miller, carder of the Limestone and Hamrick Mills, Gaffney, S. C., tells of the better running of one of his mills over the other—the only difference being a vertical opener in the poorer running mill. From what I can gather from my reading there must be something radically wrong with the way he is running his opener. I fail to see where the longer ageing of his cotton will enable him to run his spinning rolls from four to eight turns over the other mill. From these statements it is a very costly proposition to continue to run his opener. I would suggest that he take some laps from his finisher picker from each mill and run them in the other and follow closely the progress of the cotton at each process to fully determine if his trouble is due to the vertical opener. This test, I think, will clearly show whether it is due to the picker room or some other process in the poorer running mill. Also, I would age some cotton in this mill and run a test through under the same conditions as in the better mill, eliminating, of course, the vertical opener. This is new to me and I should be pleased to read later of the cause of this trouble. It would seem advisable for him to stop the vertical opener anyway, until he is sure that it is that machine causing the trouble.

I also read quite a little about the cleaning qualities of the Murray opener. If, as stated, so much waste and dirt is taken out it surely should give good carding as the dirt and sand will not dull the teeth on the card clothing. Does this machine take out the leaf as well as the sand? Does it in any way break the leaf up into smaller particles without removing them?

In the carding discussion at the textile school in Fall River, reported in January COTTON, I think Mr. Guthrie has brought out some interesting points, for we know very little about humidity and it, or the study of it and its use in cotton manufacturing, are becoming very essential and will mean a great amount of money to a concern. I believe at present there are very few manufacturers who realize that humidity has any effect upon the running of the cotton through the mill. I had a fair idea of its value but after seeing "Thirsty Cotton" as put in moving picture by Parks-Cramer Company I realize that my conception was very slight. I believe that if the owners and agents of the mills could see this picture there would be a great boom in the installation of humidifying systems. I have watched the improvement in running under these conditions and I fully believe in it.

There are two things brought out by Mr. Rooney in his discussions as reported in that story that I would like to read about in this column. One is his setting of 2½ inches for the back rolls on draw frames, ribbon and sliver lap machines, irrespective of length of staple. To my mind he is wrong and will not get the best results under these conditions. This is where difference of opinion enters and possibly we will get something from it. The


TOP COVER SWINGS BACK FOR INSPECTION WITHOUT DISTURBING SETTING OF BOBBIN TENSION BELTS. THESE BELTS HOLD BOBBINS AGAINST CLEANING ROLL, PERMITTING ROTATION OF BOBBINS.
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ARROWS INDICATE ROTATION OF CLEANING ROLL, SCAVENGER ROLL AND BOBBINS BEING CLEANED.
WASTE ENTERS RECEIVER HERE
BOBBIN DISCHARGE CHUTE
WASTE RECEIVER
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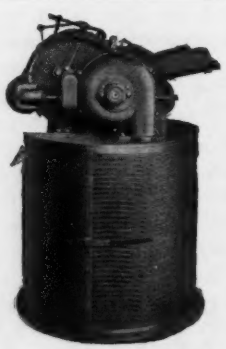
There are two card clothing covered rolls in the Termaco. The large roll does the actual cleaning of the bobbins, and the small one strips the waste from the cleaning roll. The combined action of these rolls re-works the roving waste as the bobbins are being cleaned.

Therefore, the machine serves a twofold purpose with one labor cost. In addition it gives you a positive and accurate control over the amount of roving waste produced.

Perhaps your first thought will be: "But this machine requires an operator and my spinners are cleaning my bobbins *at no additional costs.*" We grant that, in part, but not in so far as "at no additional cost" applies.

A spinner is a skilled operative. The Termaco does not require a skilled operator. It takes more of the spinner's time to clean a bobbin by hand than it does for a Termaco operator to do the same work with a Termaco. You are paying spinning wages to have your bobbins cleaned, and the method is much slower.



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Lubrification of ball bearings is made easy and positive by the Alemite system of lubrication.

Reworked waste is gathered into the receiver or may be piped to the floor below.

Hand cleaning provides no method of waste control. "Many mills are making two to three times as much roving waste as is necessary." The Termaco assures accurate control over each bobbin. Hand cleaning frequently means cut bobbins. The Termaco keeps new bobbins NEW and improves the condition of old ones which have been cut.

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other is the long draft on cards. How does long draft improve the work? Is it better to run a light lap and have less bulk under the feed roll or to feed a heavy lap and have this great bulk, but feed slower? Will the licker-in perform better work by passing through a thin sheet and few fibers or by passing through a thick sheet and many fibers?

Carder (Mas.)

Advice to a Young Overseer.

EDITOR COTTON:

For the benefit of ambitious second hands who aspire to become overseers, I wish to relate an experience of having my second hand chosen as an overseer in another mill, and to repeat the advice I gave him when he left me after four years of almost daily contact with him.

I knew his disposition quite well. He had informed me several months before that he expected to try for the place as overseer of carding in this mill, which is modern in size and equipment. When offered the place he asked permission to go see the plant and confer with the superintendent. Some of the conditions I knew—I was well acquainted with the superintendent for whom he was to work.

"John," I said, "you have made me an exceptionally strong man in this department, and you are about to venture out as overseer, among strangers and in a room with which you are not familiar. I may be able to give you some pointers that will help you.

"First, I know that you fully understand the necessary calcualtions in the carding department and are above the average fixer, from the bale breaker to roving frames. But this alone does not equip you for the position you are offered. The superintendent, although very obliging, is a busy man and you will be thrown largely upon your own resources. The fact of being tendered this place is evidence of his great confidence in you, and you should keep that confidence inviolate.

"You will be given sufficient time by your superintendent to acquaint yourself with local conditions and the help situation. Immediately on assuming charge, go to work. Meet the second hand and all the section men. Request their cooperation, assuring them of yours. Remember that first impressions are the most lasting. Also, it is a great misfortune not to have enough wit to speak well, nor enough judgment to keep silent. You have been a loyal follower about to be transformed into a leader. Your individual success, and the success of the department of which you will be in charge, depends largely upon methods you employ. Be assured you will not get more out of this job than you are willing to put into it by cooperation, honest effort, good judgment, consideration and kindness. The Golden Rule—if blended with discipline—works well with employees, that is, to do unto others as you would have them do unto you. Many occasions will arise when you as overseer will be called upon to make decisions. Avoid jumping at conclusions, but once you have determined on a course of action, after considering the indirect as well as the direct effects of such action, put your whole heart into the work in hand. One of your rules should be to follow a thing doggedly through until completion. A number of irons in the fire at one time is not good policy.

"A change of jobs, working system, and increase of wages are a few of the many requests often tried out on a new overseer. Remember that any caliber of man can increase pay—also that considerable tact and diplomacy are required to decrease pay and retain good help.

"Any contemplated changes of importance should be discussed with the superintendent, but do not annoy his patience with the minor details of your position.

"The days of a driving overseer—the man-eating kind—are over. That kind has no place in modern industry. You've asked for my advice, and I am going to be candid with you. One must avoid getting mad with the employees, as this can only involve persons and not business matters. And you have some temper. Always try to control this, especially in the early morning hours. However frivolous a complaint may appear, it often harbors discontent, and discontent hinders production. Get acquainted with those in your department by name and disposition. Guard your speech. When you stand up for your firm and speak well of it you are saying a good word for yourself. Someone has said, the human mind yearns for delusion, and for that reason will never accept absolute truth as its guide. Correct anyone who may have the wrong idea of the firm. Be a congenial overseer and leader of your department.

"One of your first acts should be to begin in the picker room and secure constants and speeds of every machine, taking note of drafts, twist and general conditions at each process up to the roving frame. Don't try to pigeonhole all these conditions in your mind. It's impossible. I see no evil in asking questions of the second hand and section men. But never rely solely on information gotten in this manner. Remember, you are responsible for results.

"Get the length of laps, ounces per yard, and the finished weight. If you have more than one kind or model of picker in use, be doubly sure of the length. Get a general sizing at every process as early as convenient, noting the gears in use.

"Get on the job early in the morning, and be the last to leave in the evenings. An overseer's presence is worth something to both him and his firm. Post yourself on required and possible production of your department. Observe the quality of work delivered at all processes, especially noting the cards, condition of fillet and the settings used. Investigate the cotton, its quality, its length, its cleanness, its spirality, and adaptability to the finished product made. Keep a check on the mixings and the reworked waste. Look over the supplies on hand, as well as the methods of and facilities for repairing machines. Is the oil in use of the proper viscosity and gravity for a good film of bearings at each machine on which it is used. Be prompt with all reports to the superintendent's office. Ask for and accept nothing short of the best efforts from everyone in your charge. Give nothing short of that. Practice and teach efficiency and economy in all things. Remember that the fittest survive."

W. V. J. (N. C.)

The Onondaga Textile Mills, Inc., New London, Conn., recently organized with a capital of $50,000, to manufacture cotton specialties, knit goods, etc., has established a registered office at 82 Trumbull Street, and will operate a local mill. Adolph Jaeger has been elected vice-president, while Williams A. Tiedemann will act as president. Ester Larsen has been elected secretary and treasurer. Extensive operations are planned.

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Mule Versus Ring Spinning.

EDITOR COTTON:

In a recent issue of COTTON I read the question of "J. R. (Pa.)" as to why mule spinning is being supplanted in this country, and why it is more of a success in England. I would not venture to give a definite reply to the latter part of his query, and I think that probably the best way to treat the subject would be to compare the mule with the ring and by discussion we may solve the problem.

In the first place I imagine that production is a big determining factor and there the ring frame has a 20 to 30 per cent advantage on counts and numbers up to 80s. The reason for the increased production is that the ring frame is a continuous spinning machine, while the mule loses 20 to 25 per cent of the time in winding the yarn on after a length has been spun.

The labor question in this country is a much more vital one than in England, the tendency here is for operatives to move about and only a comparatively small percentage stays with one concern for a life time, whereas in England 90 per cent of the male help commence in one mill after leaving school and remain with that mill the rest of their lives; five per cent probably leave to get promotion elsewhere and the remaining five per cent are the wanderers; so that a manufacturer can depend upon having his help there and the machines being run. Hence, it pays him to train men—as, of course, the running of the mule demands much more skill than the ring frame and consequently the wages paid are higher. The capital outlay in a ring mill per spindle is greater than the mule mill on account of the larger number of preparatory machines.

Where a manufacturer wants yarn for beams he prefers ring spun, because he is not concerned with the winding and beaming; then the yarn is not so soft as the mule spun and carries better through the subsequent processes.

Ring yarn is spun on bobbins, so that the spinner has no option but to wind the yarn, as, of course, he could not afford to have thousands of bobbins in transit. Mule yarn is spun on paper tubes so that the mule spinner does not necessarily have to wind the yarn. In the case of weft or filling this is a decided advantage as the cops leave the mule frame ready for the shuttle, whereas the ring yarn has to be re-wound. Though this advantage is not so great as before the general use of automatic looms, where special bobbins are used for the shuttle.

Up to a certain point the more twist put into a yarn, the greater is its elasticity, therefore the ring yarn claims this advantage. The individual tension present on the ring prevents any excessively weak places from passing forward, as the weak yarn would not be sufficiently strong to pull the traveler around. In the mule the tension is collective and weak places are not discovered to the same extent. The increased twist and elasticity in the ring allow the yarn to pass through the subsequent processes with less breakages and gives a slightly stronger yarn. It is in the production of a level, soft yarn that the mule stands well in front of the ring. I would appreciate further discussion on this subject.

Before closing I would like to say a word further about college men. In the February issue "K. H. (Ga.)" expresses surprise at my attitude after graduation. I can only gather that he has never visited England, the land of my birth, and that he knows nothing of class distinction. In my opinion he ought to be grateful that he was born in a country where a man in overalls is equal to any "white-collar" man and where it is not "infra dig" for a college man to roll up his sleeves and "dig in." I thank him for his censure and fully agree—conditions as they are—that it was warranted. Now that I see things in their true perspective I am not likely to make the same mistake again; if mistake it can be called. Perhaps it would be better to say that I had not become sufficiently Americanized. I admire the spirit of Georgia Tech and believe they create the right atmosphere for their students.

N. F. (N. C.)

Disagrees on Tension Gears.

EDITOR COTTON:

I was interested in the article by "T. A. A." in the April number entitled, "Lay Off the Tension Gears." The purpose of the article seems to have us change the present practical way of altering the tension on fly frames. "T. A. A." would have us change the lay gear instead of the contact or rack gear. He is quick to criticise "A. B.," who is right, and of course, "Wash," as usual, as one of those fellows who has much to learn about fly frames. Having his mind so centered on "A. B." and "Wash," he overlooked the fact that the lay gear is also a tension gear.

He begins his article by telling us something we know, and ends it by discussing a point with which he does not seem familiar. When "A. B." stated, "If the ends become too tight the tension gear should be changed," he was perfectly right. Discussing this, "T. A. A." says, let me call his attention to the fact that it depends on the size of the bobbin whether the tension gear is responsible for tightness or the slackness of the ends." Now it is safe to state here that there is not a single reader of COTTON who does not know this fact.

If "T. A. A." answers this letter, and I hope he does, I, for one, would appreciate having him explain the difference in the following explanation. For the sake of illustration, let us assume that a frame is running with a tight tension, which, of course, causes stretch, and calls for quick action. According to "T. A. A." we change the lay gear instead of the rack gear. The change would of course be made to open the coils on the bobbin a little more. By such a change you are obliged to start the frame with the same tight tension, and the ends are stretched until the bobbin has been traversed a few times at least. In other words, you get no immediate benefit. To receive immediate benefit, you must change the surface velocity of the bobbin. By changing the rack gear, the fixer will move the rack on the slack side, equal to a tooth in the rack gear, and you get immediate benefit from the change at the completion of each traverse.

There is only one way to build a bobbin of roving, and that is to have the layers as close as possible without riding the preceding coils, and regulate your tension by the rack gear. Why? First, you get immediate benefit, second, it is easier to change the rack gear, and third, few mills, if any, have on hand lay gears for all ranges of hanks.

If the coils are too open, the diameter of the bobbin

will not increase as fast, and this in turn will decrease the surface velocity of the bobbin. If we put on a slacker rack gear, the movement of the rack is greater and the surface velocity of the bobbin is decreased.

Now, if "T. A. A." thinks I am wrong, I hope he will explain the foregoing.

When I said "I take very little stock in percentage of regain and humidity," I knew it was a 10 to 1 shot that someone would bite. For the benefit of "T. A. A." and others, I give below the laws of regain:

(1) For a given relative humidity, the regain is less at a high temperature than at a low one.

(2) So, to maintain a given percentage of regain, it is necessary to maintain an ascending scale of relative humidities if the temperature is rising, and a descending scale if it is falling.

(3) Further, while the rate of ascent or descent is variable throughout the whole range, that within the limits under consideration it is fairly constant.

(4) For a given difference of regain, an increasing difference of relative humidity is required as the temperature rises.

(5) But while the actual difference is increasing, the rate of increase is fairly constant.

(6) While the isothermals, or temperature curves, corresponding to regain and atmospheric moisture diverge greatly as the temperature rises, the curves of relative humidity are approximately parallel.

(7) And finally, from all of which it is evident that a series of parallel and variable scales of relative humidity can be prepared that will approximate constant percentages of regain, regardless of changes in temperature.

It is useless to state here that the closer temperatures are maintained, as well as the humidities that correspond thereto, the better will the work run, and the greater the comfort of the workroom.

Imperfect ventilation and low humidity spells disease.

In our mills we have hygrometers in every department. We run day and night, and running conditions are maintained during the week-end. That is why I take very little stock in percentage of regain and humidity.

Humidifiers are like automobiles. A man who owns a Ford only *thinks* he has a car, and it is the same with the different types of humidifiers.

As regards my having trouble with fly frames, I would say that my troubles are similar to those of the ones running the bobbin-lead system. I still have stretch and to this writing I have not heard of anyone who has perfected the system. Wash (R. I.)

Card Grinding Roll Speeds.

EDITOR COTTON:

With reference to the discussion on card grinding roll speeds, I agree with "J. F. C." on reducing the revolutions of the roll, and grinding more lightly. I have reduced the speed of mine from 742 to about 564, and I think that is giving me a much better point on the wire. It feels better and holds it much longer. I believe that it grinds more from the side of the wire, and naturally pulls the side of the wire, against the emery and does not grind so much from the top or surface of the wire. P. T. E. (S. C.)

Apportioning Work.

EDITOR COTTON:

In answer to "I. K. (Mass.)," who asks about apportioning work, I would like to give him a method which I have worked on and have seen in other mills to be about the same and which seems to be getting good success; by that I mean a good production at a fair cost per pound.

I would make my cards in sets of 19 to 22, a man running both fronts and backs.

A set of drawing would be eighteen deliveries and should be able to keep up with the cards and the operator would be able to keep her work clean. On drawing I would place a girl if possible.

Slubbers—one pair of 56-spindle frames for a woman, or a pair of 72 spindle frames for a man, this latter being rather hard for a woman as they are high, but a woman can easily take care of the smaller pair.

Intermediate frames (1.40)—a woman can take care of a pair of 84-spindle frames, but I much prefer having a man on the job.

Fine frames (4.5)—a woman can easily handle a pair of 160-spindle frames and have plenty of time for cleaning.

Spinning—of course we have different kinds, but a fairly good spinner should be able to run between 1,200 to 1,300 spindles.

On combers, a girl can take care of eight, and should be able to keep them clean.

On ribbon lap and sliver lap machines I prefer a man, and he can take care of one of each without trouble, but I have had girls on them and they do not get off the production.

In all cases I do not believe so much should be given a hand that he will not be able to clean his machines properly. Machines properly cleaned and oiled will make nice clean and even work, surely there will be less chance for slugs and we all know what trouble slugs can give. And if not properly oiled, the bushing of the drawing and comber rolls will not work as they should, the roving frames will run harder, the results will be loss of production and breakdowns coming right and left.

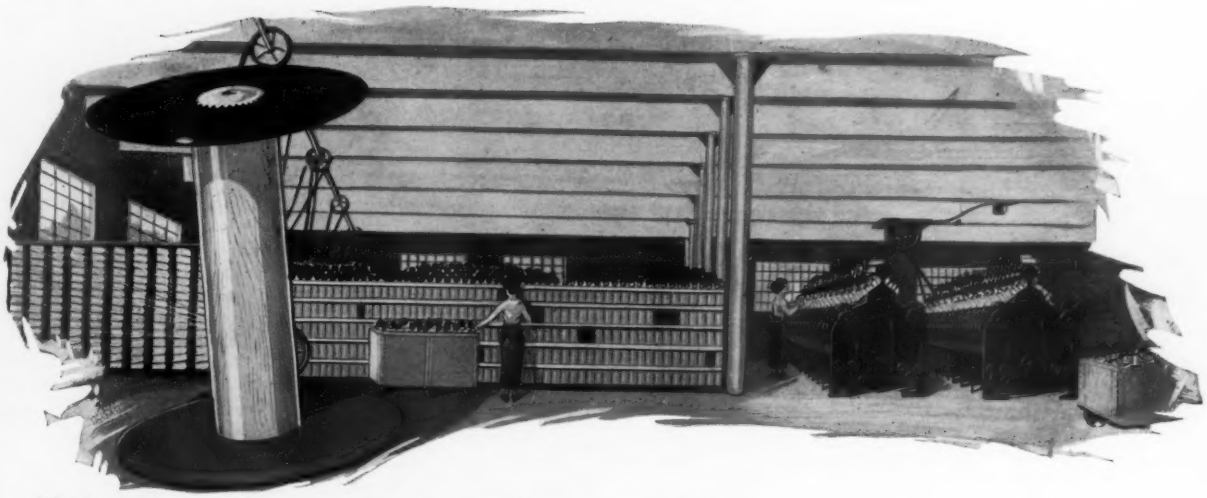
The draw frame tenders should be taught to place the end up to the rolls instead of throwing it, as if they were fishing—or, as "Old Timer" says, as if they were driving Texas steers. E. A. G. (N. H.)

EDITOR COTTON:

In order to do my part toward keeping the discussion section interesting I desire to submit the following that may throw some light onto "I. K.'s" inquiry as to "Apportioning Work Per Operative."

In answering this inquiry of "I. K.'s" it is apparent that quality is secondary to production as his numbers are comparatively coarse—23s and 36s. The desire for production would thus tend to limit the number of machines per operative expecting a fair degree of cleanness as to machinery.

I believe that probably a mill that were to run 23s and 36s would apportion their work per operative identically the same up to spinning and so I offer the following as a guide to "I. K." As I understand his inquiry he desires to know from carding on.



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Cards per operative, 14-16—preferably 14.

Deliveries of drawing, 20 per operative.

Slubber, .50 hank, 72 spindles per frame—2 frames per operative.

Intermediate, 1.4 hank, 108 spindles per frame or 216 spindles per operative.

Roving, 4.5 hank, 176 × 2 equals 352 spindles per operative.

In spinning a 23s, 8 sides per spinner.

Now for the other arrangement as "I. K." suggested for spinning a 36s, I would suggest the same so as to be adaptable for either case excepting in the spinning, change to 10 sides per spinner.

In an average mill, I believe a comber tender could take care of 6 combers. One hand to 4 ribbon lappers and one hand to 4 doublers. I trust that we may have other replies to this inquiry.

I should also like to mention that I think that the inquiry that asked for a discussion on cone winding is one that I trust that COTTON'S readers will open up and pave the way for some real information for those of us who are not so familiar with that subject as regards troubles, speeds for various numbers, spindles per operative, piece rate or day pay for this operation, advantages and disadvantages, and similar subjects. Bert (R. I.)

EDITOR COTTON:

In replying to "I. K. (Mass.)" in regards as to how many frames or spindles would be advisable per operative, I would like to suggest the following:

Cards, 65-grain sliver, 12 machines per operative. Operative doing the doffing, stripping, cleaning and putting laps in at back.

Drawings, 65-grain sliver, 20 deliveries per operative.

Slubber, 0.5 hank, 96 spindles per operative. Operative must doff and have about one spare hand on as can carrier to every five frames to carry cans to back and help put them in.

Intermediate roving, 1.4 hank, 240 spindles or two frames per operative. One doffer to two pair of frames.

Fine roving, 4.5 hank, 280 spindles or two frames per operative. One doffer to every two pair of frames.

Spinning 36s, 8 or 10 sides to an operative.

On 23s I would suggest the same layout.

On combers, one operative should take care of six frames.

On ribbon and sliver lappers one operative should take care of one ribbon and one silver lapper. If they are run at a low speed one operative could take care of two ribbon and one sliver lapper or the other way around.

E. S. B. (Mass.)

High Twist in Effect Yarns.

EDITOR COTTON:

I have never answered any of the questions in COTTON before, but I was interested in the query of "Contributor No. 13" and perhaps I can be of assistance. In making 30s with 45 turns of twist per inch, I would use the best 1⅛-inch cotton I could get. In putting this much twist in 30s yarn out of 1 1/16-inch stock, he would twist the end of the fiber off and in one inch of 30s yarn with 45 turns of twist there is hardly a long enough staple to take care of it satisfactorily.

I am today running 20s with a twist multiplier of 10, 20s $\sqrt{10.00}$, thus:

20s sq = 4.47 × 10 = 45 turns per inch.
25s sq = 5.00 × 9 = 45 turns per inch.
40s sq = 6.32 × 7 = 44.29 turns per inch.
50 sq = 7.07 × 7 = 49.09 turns per inch.

You will notice that all of these yarns are on the same ratio practically with the 30s yarn of "Contributor No. 13." I ran them somewhat similar ten years ago. To make them correctly you must put in extra good stock. It is almost an impossibility to make a perfect piecing on a spinning frame with this hard twist, and it must run just as near to perfect as possible, because every piecing shows in the cloth.

I will say in closing that in making yarn of this character, breaking strength is not considered so much as getting the effect desired in the cloth and that comes from the good spinning of the yarn. L. C. (Mass.)

EDITOR COTTON:

In connection with the discussion of making 30s yarn out of 1 1/16-inch cotton, I would say that if I were going to make 30s yarn I would by all means prefer to have a good staple cotton. I would prefer 1⅛ inch if possible. Too many mill men try to make a big saving by attempting to run a short cotton, and before the yarn is spun they have lost all they apparently saved and more besides. Short cotton means a lot of waste and bad running work. Bad running work puts the crimp in production and quality also and in these days we must have both or drop out of the race. To get either or both we must have skilled help, and skilled help are the first to seek other fields when bad running work continues for any long period in a plant. Especially so if they are paid with piece-work rates.

A little bit added to the staple helps the strength wonderfully and keeps the ends up and every spindle producing, not to mention the fact that much less twist need be inserted with the resulting increase in front roll speed.

If necessary to economize on the cotton, by all means drop the grade a bit but get the staple.

The 30s yarn in question calls for 45 turns of twist. This puts this yarn into the class of specialists, as 45 turns is approximately double the standard twist ordinarily used. Apparently the yarn to be made is not twisted for strength as 45 turns would be away beyond the point of increased strength from inserting twist, but is twisted for some special or novel effect alternating right and left hand twist, a few ends in each stripe, with low pick per inch in filling so that the cloth might contract excessively and produce a crepe or pucker or kinky effect.

Such yarn could be spun with a cotton of 1 1/16-inch staple because this twist would hold the ends up under practically all conditions, but production with such a twist would be low as front roll speed must be low if spindle speed is kept anywhere near proper.

I do not know what the breaking strength would be as this could only be determined by actual test with the actual cotton being used, because this yarn is not made to any present adopted standard.

In conclusion I will say that not knowing what use the yarn is to be put to, it is merely conjecture as to what staple should be used, but I have given you the best information I can. G. S. B. (Conn.)

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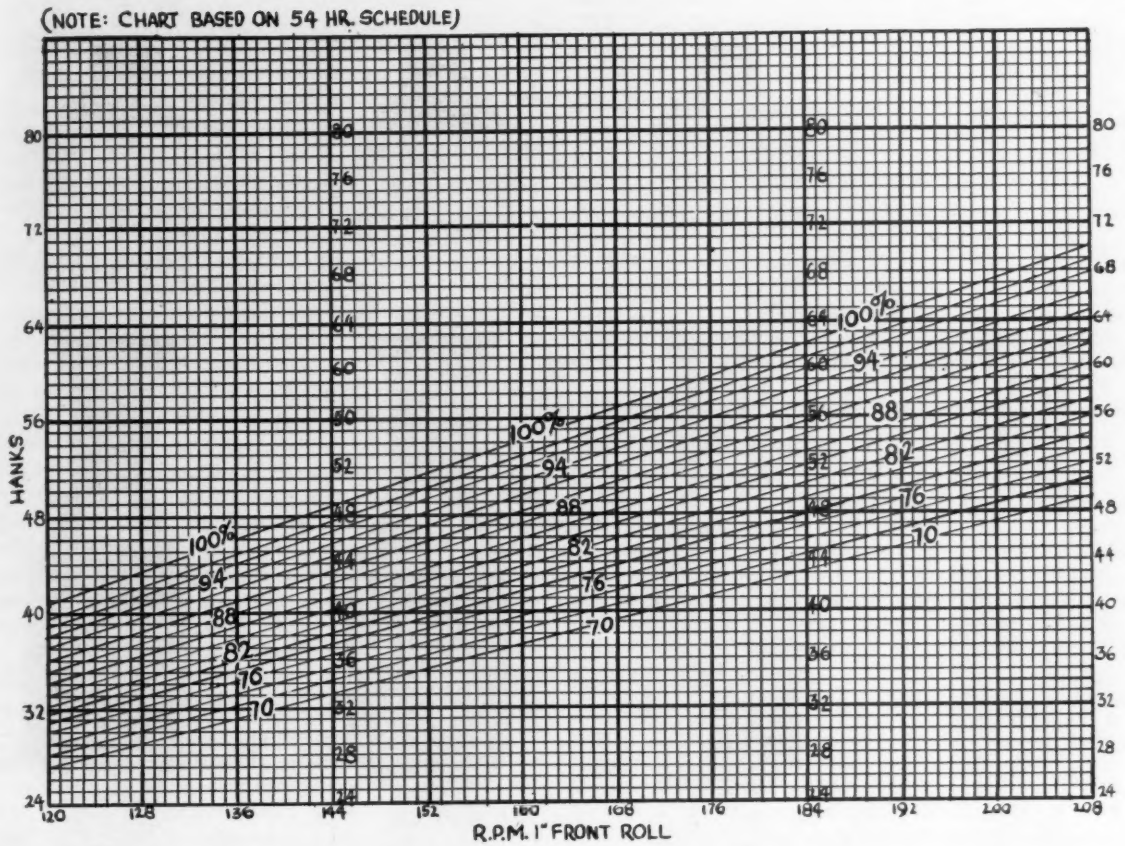


A Spinning Frame Efficiency Chart.

EDITOR COTTON:

Spinners and superintendents will find the accompanying spinning frame efficiency chart a great time-saver in their work, especially those spinners who are not blessed with one or two numbers of yarn. The way to use the chart is as follows:

Suppose we were running some 15s, and the front roll speed was 168 r.p.m., and we wanted to know how many hanks a week we could expect from our frames. (The accompanying chart is based on a 54-hour week.)

The first step is to time several sets and see just how long it takes the bobbin to fill up. Let us assume that in this case it takes a bobbin 90 minutes to fill up. We know from past experience, or from actual studies, that our spinners or doffers can doff the frame in three minutes. Then to get the efficiency of the frame we would use the following:

$$\frac{\text{Time it takes frame to fill}}{\text{Time it takes frame to fill} + \text{time to doff}} = \text{Efficiency.}$$

In this case:

$$\frac{90}{90 + 3} = 97 \text{ per cent Efficient.}$$

Now we are all set to use the chart. We find the speed of the front roll to be 168 r.p.m. on the bottom of the chart. We follow this line up until we come to the angular lines representing efficiency and stop halfway between the 96 per cent line and the 98 per cent line, which will be the 97 per cent efficiency of our frame as figured. Then following this point across the chart horizontally to the upright lines on which the hanks are represented, we find that this point is on a horizontal line one space below 56, which means that we could expect to turn out 55 hanks a week with our frames running under the conditions outlined.

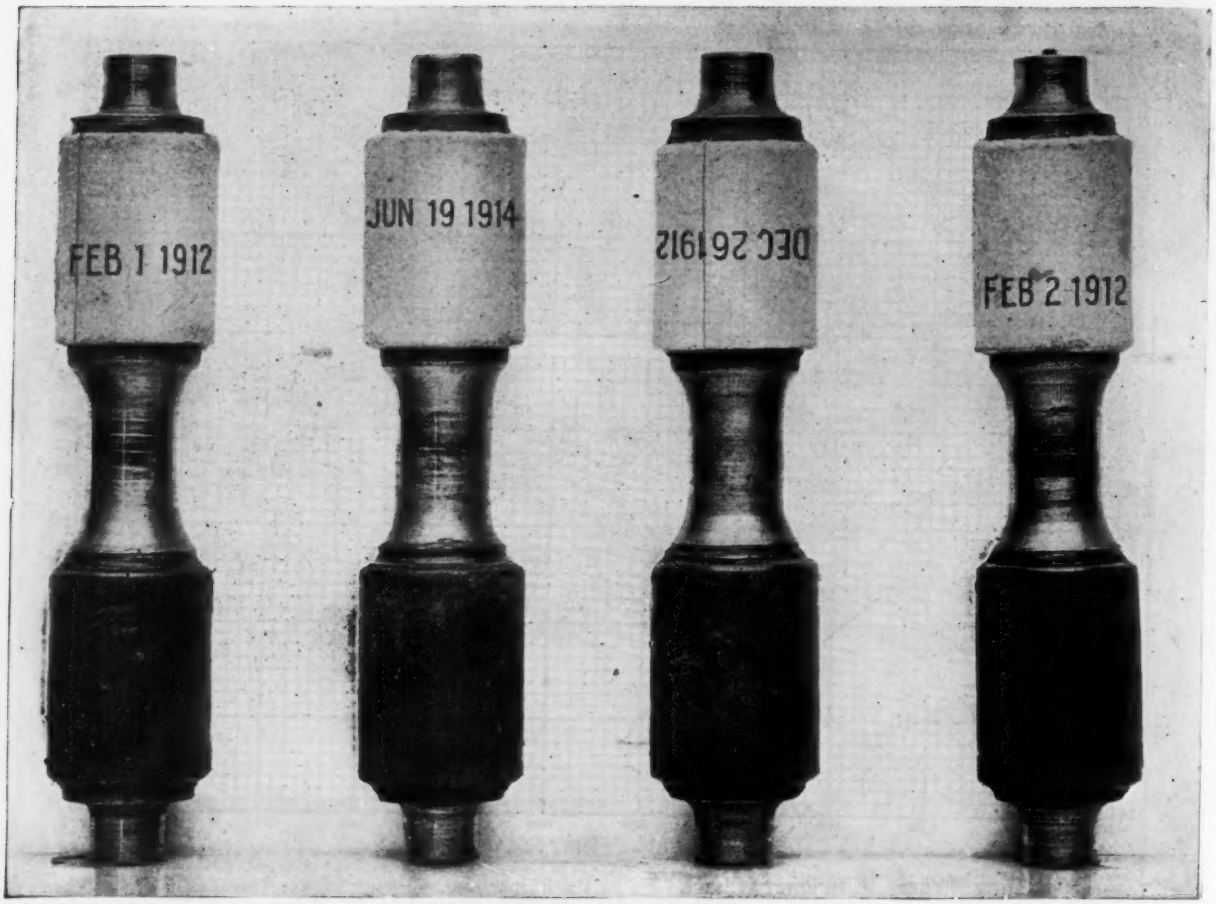
The chart is really a lot simpler to use than the foregoing description would seem to indicate, and if efficiency is accurately obtained, will give very accurate results.

The chart can also be used to find the efficiency at wh h a frame operates. For example, if we got 56 hanks from a frame that had a front roll speed of 176 r.p.m., trace the 56 hank line across until it crosses the upright line representing a front roll speed of 176 r.p.m., and note that this falls on the per cent line representing or marked 94. This means that the frame operated at an efficiency of 94 per cent.

It is a very easy matter to make a chart for any number of hours that the mill runs, and if any of the readers do not understand just how to do this, the writer would be glad to supply the necessary information.

N. L. W. (N. H.)

A new suggestion for increasing production is presented in a recent pamphlet of the American Blower Company, Detroit, Michigan, which illustrates the use in industry of the company's "man cooling fans" which, it is pointed out, are particularly applicable in those "hot spots" around the industrial plant where production may be hampered by the excessive heat. The "man cooling fan" resembles a giant sized desk fan, and weighs several hundred pounds. It is driven by a 4-hp. motor.



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There's a Difference in Mills.

EDITOR COTTON:

In the March number of COTTON I notice "Old Timer" says, in regard to overseers, "Get some of that old time pep which you had when you secured your first overseer's position." Now I would say to the overseers whom the coat fits, "Put it on," but there are a vast number of overseers to whom the coat would be a mighty poor fit.

I know of some overseers who have been on the same job for a number of years, and they are just as anxious to increase the production and improve the quality of the work as they were on the first day they started in on their position. But in some of the mills, the overseer has the pep and ambition all knocked out of him by the failure of the management to do their part in improving things and in not getting the necessary supplies to work with. But probably in some cases the condition of the cloth market will not allow of too great an expenditure of money at certain times, but be that as it may, it seems to me that money spent in *necessary* improvements always comes back, and with a goodly interest besides, in much better running work, a greater production, and better quality of finished goods—and, last but not least, a more satisfied and contented set of operatives.

One can go into a good many of our old New England mills and find cards running with the wire all broken out on the doffers and cylinders and top flats, the flat chains worn out so the flats drag on the stripping or percentage plate, pressing it down on the cylinder wire and taking the edge all off the wire. One can also find lickers-in so dull that they are almost useless for their designated purpose. And many times the overseer will say, "I've tried to get card clothing, but the management says it costs too much! What can I do?"

A good many small and medium sized mills have no licker-in grinder. I think all mills should have one, for there are not many things about a card which can be done that will improve the work more than a good sharp, licker-in, or one which has been newly covered.

If the reader interested will take out a dull licker-in and put in a good sharp one, he can notice a remarkable difference in the carding. He will get out more dirt under the licker-in, and a much better sliver. I don't think that there is another machine in the mill where money could be spent in repairs to greater advantage than on the cards. And yet, in some very good mills, one will find the card in a mighty poor or rundown condition.

I have known mills where some of the clothing on cards had run 25 or 30 years, and with the wire ground down nearly to the bend or knee. And every time the grinder traversed it would grind off some of the flange on the doffers due to the wire being so short. And yet the superintendent will ask the overseer why his carding is not so good as in some other mills, where the cards are in much better condition. This is one of the things that take the pep and ambition out of some of our best overseers.

I think that the cards in any mill should be kept in as good condition as possible, even if one has to cut down the expense in some other ways, wherever possible, to do it. There is no other machine in the mill upon which the success of the mill depends so much as the cards. One can go into many mills and find the doffers on cards making 12 and 14 r.p.m., and the cards in very poor condition at that. This is too fast, if the quality of the goods depends on the carding. Many carders are obliged to run their doffers at that speed or even faster, in order to put through enough carding to keep the rest of the room running. And then they get blamed for poor carding! A speed of 8 or 9 r.p.m. is enough for the doffers, and if the carder cannot put through enough work at that speed to keep the rest of the room running, then he should be given more cards.

I have in mind a mill man who, on starting up a new mill, insisted upon putting in an extra number of cards. Even the machine builders told him that he did not need so many cards as he had planned for, but he was firm. And today he is one of the most successful mill men in the country.

Good carding is the principal thing which makes the cloth from a mill stand well in the markets. And good overseers are one essential which helps to keep a mill in the game. No mill manager can have a very successful mill with an inferior set of overseers. And yet, during the war and since, the overseers and second hands have not been paid but a trifle more than some other operatives who have no responsibility at all. But the overseer must work for many years to obtain the experience necessary to the successful running of a room—the cart is surely before the horse in this case.

Where are the mills to get experienced overseers and second hands in the future if this sort of thing continues? None of the young men seem overanxious to work up to the position of second hand or overseer. If they are asked the reason for their seeming lack of ambition, they will tell you that they can make nearly as much money in the position which they hold as they could if they were second hands or overseers, and they don't now have the responsibility. This is another condition of affairs that takes the pep out of an overseer as well as a good many young men who would otherwise like to work up to the position of second hand or overseer. And I, for one, can't blame them. Why, in a great many mills, there are any number of operatives making more money than the second hand. Now does that seem right or just, when we know that a second hand must work a long time before reaching even that position? Most certainly not!

And here is still another condition of things which makes an overseer lose his ambition and pep. We will say that an overseer of carding takes a new position. He has lots of pep and push. He improves the carding, and gets a greater production. And, of course, when he gets better carding, the work will improve all through the mill. In fact, he beats the dickens out of all the overseers who have been on the job before him—as "Old Timer" says—and *then* he will be given a shorter staple, lower grade cotton out of which he is expected to make the same numbers. And then he will have to put in twist, reducing his production, the quality of the work will not be goods, and in a little while the management will *forget* about putting in lower grade stock and the overseer will be blamed because the work is no better than it was before he took the room to run.

And now, if this escapes the editorial waste basket and is read by many overseers of carding, I know there will be some who have been up against just such a proposition, and

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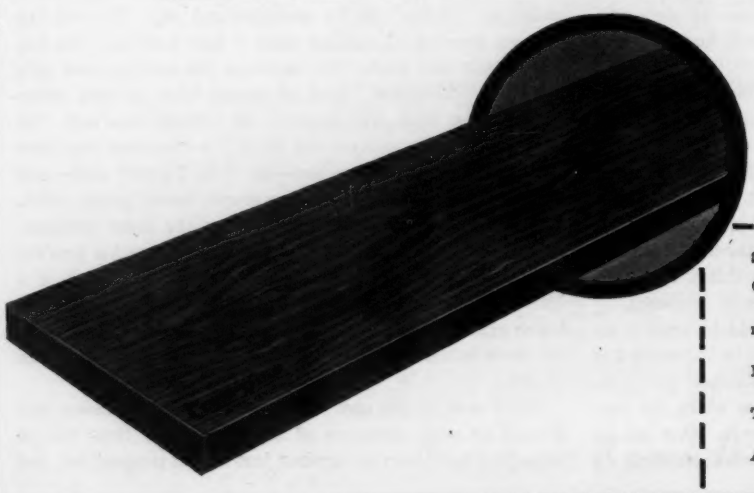

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maybe this is the *very thing* which has slowed them down some. And then again, there is a great difference in overseers.

A Class A man is on his toes and runs his room for all there is in it. He is a good judge of cotton, can fix and figure any machine in the room, and he keeps all machines in good running condition.

Class B or C overseers run their rooms in an easy-going sort of way, with dead spindles on the speeders, the traverse too short on speeder bobbins when one-third more roving could be put on making the bobbins run much longer in the creels of the next process. These types are also poor fixers or judges of how a machine should be fixed, are poor managers of operatives.

And yet Class B and C overseers seem to get by and are paid as much as Class A overseers. If a mill has Class A overseers, men who "have beat the dickens" out of other overseers who have gone before them, I think that the management should encourage them by at least letting them know their work is appreciated. Men do not care to be praised or petted but at the same time it would encourage them in their work to let them know that the management appreciates their earnest endeavor. And they might try to "ginger up" more than ever. I believe that a word of praise or encouragement to those who deserve it helps them to do even better than ever, and I believe that this applies to all operatives as well as overseers.

There are overseers who will take a room to manage, and for a year or two will do fairly well, and then they will begin to skid. There will be dead spindles all over the room. They seem to forget that the speeder operative gets just as much per hank with dead spindles on the frame, but the company does not get the full number of pounds. There will be bad rollers in the drawing and speeders. Stop motions on the drawing not working properly, making singlings, which will make hundreds of yards of yarn too light when it gets to the spinning room. The cards are not ground and set as they should be, and things get worse every day. It's mighty easy to let things get all run down. But it is a tremendous undertaking to bring a room up after a Class B or C carder or spinner has had hold of it. And I think that overseers who have taken a room in such a condition to manage, will agree with me in this. What I call a good overseer or a Class A man is one who can take a room which is all run down, bring it up into good running condition, and *keep it there.* And I do not think that any company will lose anything in the end by getting such a man the necessary supplies with which to work. K. C. (Conn.)

A new type of belt, known as "Tight-line" construction, is described in a pamphlet issued recently by Graton & Knight Mfg. Company, Worcester, Mass., who developed it upon the basis that the most economical power transmission by belting can be obtained only where the belt throughout its entire width comes into complete contact with the pulley faces on which it operates. In this new construction, two backbone centers do not come directly over the highest part of the crown. Instead, the backbone, firm fibered center on the outside ply, comes directly over the section of long fibered elastic stock on the inside ply. This, it is pointed out, is to insure better balance and provide more elastic stock at the center to conform readily to the crown of the pulleys.

Inserting Twist on the Ring Frame.

EDITOR COTTON:

In the March issue of COTTON, in "Christy's" letter on which inserts the twist, the traveler or the spindle, I must point out that "Christy" is on the wrong track when he states, in this discussion, that "you cannot ignore the traveler, and to compare the twist as put on in ring spinning with the method used on a mule is not fair to the student." Twist can and has been inserted by ignoring the traveler completely. This was done in the city of Providence, R. I., in the year 1910 by a Mr. Atherton.

Again, when "Christy" says, "The yarn on the ring frame is held at the nip of the roll and traveler," he is wrong. At no time does the traveler hold the yarn. It guides the yarn.

"L. R. M.," who started this discussion, and the others interested, should bear in mind that we are discussing the spindle and traveler, not machines. Wash (R. I.)

EDITOR COTTON:

I have been quite interested in the letters of the several writers in regard to the insertion of twist on ring frames, but I do not agree with all the statements made. I disagree with the statement of "Christy (Mass.)" that less twist is put into the yarn as the diameter of the bobbin increases, and I will try to prove later on that the yarn has more twist per inch as the diameter of the bobbin increases.

From my observation and study I find that practically all mill men use the spindle r.p.m. when figuring the turns per inch in yarn and for all practical purposes this will answer and save time, the difference in the twist not being great enough to cause any great amount of trouble.

We all know that it is necessary to revolve the spindle before any twist can be inserted, but if that was all that was done what would become of the yarn being delivered from the front roll? It seems that we do not always consider that winding must take place at the time delivery and twisting are taking place, and this can only be done by the spindle, yarn and traveler, working in conjunction. When we say that the spindle inserts twist we should consider the results when there is no traveler on the ring, we quickly find that the end is not receiving twist and is broken; also notice the effect when the traveler is held stationary on the ring. This can best be observed on a twister; sometimes in starting a twister we find that the traveler does not start, and in looking closely we see the ply threads passing under the traveler and being wound on the bobbin, if we will draw this yarn off the bobbin from the side, we find that the two or more strands are in parallel order and without twist. This is a good proof that twist cannot be inserted unless the traveler is running around the ring and that the twist is inserted between the front roll and the traveler.

I will now try to prove that my statement is correct—that more twist is inserted as the diameter of the bobbin increases:

Let us assume the following conditions: R.p.m. of spindle, 8,000; r.p.m. of front roll (one inch diameter), 100; diameter of empty bobbin, 5/8 inch; contraction of yarn by insertion of twist, 3.5 per cent.

I am going to show the winding speed of the bobbin, or

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in other words, the r.p.m. of the bobbin necessary to wind on the yarn delivered, minus contraction, at diameter increased ⅛ inch over the bare bobbin, also the traveler speed for each diameter, and the turns per inch for each diameter.

100 × 3.14 = 314 inches delivered per minute from a 1-inch roll.

314 × .965 = 303 inches to be wound on a bobbin every minute.

⅝ × 3.14 = 1.96 inches circumference of a ⅝-inch bobbin or the number of inches around it.

303 ÷ 1.96 = 154.6 r.p.m. needed by a ⅝-inch bobbin to wind on itself 303 inches of yarn.

8,000 — 154.6 = 7845.4 r.p.m. of traveler when the bobbin is ⅝ inch in diameter.

7845.4 ÷ 314 = 24.98 turns per inch in the yarn when the bobbin is ⅝ inch in diameter.

Next we add ⅛ inch in diameter, which makes 6/8 inch.

6/8 × 3.14 = 2.35 circumference of a bobbin 6/8 inch in diameter.

303 ÷ 2.35 = 128.9 r.p.m. of a 6/8-inch diameter bobbin to wind on 303 inches of yarn.

8,000 — 128.9 = 7871.1 r.p.m. of traveler when bobbin is 6/8 inch in diameter.

7871.1 ÷ 314 = 25. 06 turns per inch in yarn when bobbin is 6/8 inch in diameter.

⅞ × 3.14 = 2.747 inches in circumference of a ⅞-inch diameter bobbin.

303 ÷ 2.747 = 110.3 r.p.m. of a ⅞-inch diameter bobbin to wind on 303 inches of yarn.

8,000 — 110.3 = 7889.7 r.p.m. of traveler when the bobbin is ⅞ inch in diameter.

7889.7 ÷ 314 = 25.12 turns per inch in the yarn when the bobbin is ⅞ inch in diameter.

1 × 3.14 = 3.14 inches circumference of a 1-inch diameter bobbin.

303 ÷ 3.14 = 96.49 r.p.m. of a 1-inch diameter bobbin to wind on 303 inches of yarn.

8,000 — 96.49 = 7903.5 r.p.m. of traveler when the bobbin is 1 inch in diameter.

7903.5 ÷ 314 = 25.17 turns per inch in the yarn when the bobbin is 1 inch in diameter.

1⅛ = (9/8) × 3.14 = 3.53 inches circumference of a 1⅛-inch diameter bobbin.

303 ÷ 3.53 = 85.8 r.p.m. of a 1⅛-inch diameter bobbin to wind on 303 inches of yarn.

8,000 — 85.8 = 7914.2 r.p.m. of traveler when the bobbin is 1⅛ inch in diameter.

7914.2 ÷ 314 =25.20 turns per inch in the yarn when the bobbin is 1⅛ inch in diameter.

1¼ = (5/4) × 3.14 = 3.92 inches circumference of a 1¼-inch diameter bobbin.

303 ÷ 3.92 = 77.2 r.p.m. of a 1¼-inch diameter bobbin to wind on 303 inches of yarn.

8,000 — 77.2 = 7922.8 r.p.m. of traveler when the bobbin is 1¼ inch in diameter.

7922.8 ÷ 314 = 25.23 turns per inch in the yarn when the bobbin is 1¼ inch in diameter.

1⅜ = (11/8) × 3.14 = 4.31 inches circumference of a 1⅜-inch diameter bobbin.

303 ÷ 4.31 = 70.3 r.p.m. of a 1⅜-inch diameter bobbin to wind on 303 inches of yarn.

8,000 — 70.3 = 7929.7 r.p.m. of traveler when the bob-

bin is 1⅜ inch in diameter.

7929.7 ÷ 314 = 25.25 turns per inch in the yarn when the bobbin is 1⅜ inch in diameter.

1½ = (3/2) × 3.14 = 4.71 inches circumference of a 1½-inch diameter bobbin.

303 ÷ 4.71 = 64.3 r.p.m. of a 1½-inch diameter bobbin to wind on 303 inches of yarn.

8,000 — 64.3 = 7935.7 r.p.m. of traveler when the bobbin is 1½ inches in diameter.

7935.7 ÷ 314 = 25.27 turns per inch in the yarn when the bobbin is 1½ inches in diameter.

1¾ = (7/4) × 3.14 = 5.49 inches circumference of a 1¾-inch diameter bobbin.

303 ÷ 5.49 = 55 r.p.m. of a 1¾-inch diameter bobbin to wind on 303 inches of yarn.

8,000 — 55 = 7945 r.p.m. of traveler when the bobbin is 1¾ inches in diameter.

7,945 ÷ 314 = 25.30 turns per inch in the yarn when the bobbin is 1¾ inches in diameter.

2 × 3.14 = 6.28 inches circumference of a 2-inch diameter bobbin.

303 ÷ 6.28 = 48.2 r.p.m. of a 2-inch diameter bobbin to wind on 303 inches of yarn.

8,000 — 48.2 = 7951.8 r.p.m. of traveler when the bobbin is 2 inches in diameter.

7951.8 ÷ 314 = 25.32 turns per inch in the yarn when the bobbin is 2 inches in diameter.

We find from the foregoing calculations that when we started to wind, or started our set, that the turns per inch were 24.98 and when the bobbin reached a diameter of two inches, that the turns per inch were 25.32. The difference being 25.32 — 24.98 = .34 turns. Now this is not much and is not considered in practice, but it will go to prove that as the diameter of the bobbin increases the r.p.m. of the traveler will increase and as the traveler puts in the twist, that the turns per inch must also increase. The question now arises, why must or should the traveler increase? As long as we do not change the twist gear on our frame and we keep our cylinder speed the same, the front roll will deliver the same number of inches and in this case it being 314 inches per minute, it was necessary to wind this 314 inches, minus contraction, every minute, and as the diameter of the bobbin increased with every layer of yarn, some part of the relation must change. We know that the bobbin, being tight on the spindle, could not change, but must stay uniform in speed, that the only other part of the connection could change, and this is the traveler. The traveler receives its speed only when there is a tension on the yarn, and lags behind the spindle the required number of revolutions to allow the yarn to wind.

I hope this article may be of information to your readers. If there are any mistakes in figuring and speeds, you must excuse me, my object being to demonstrate that my statement was correct.

Carder (Mass.)

Editor's Note.—"Christy" has already caught his inadvertant error and asks the same question as "Carder" on page 729 of the May number. However, "Carder's" explanation of this feature is so plain and clear that it is utilized as a demonstration of the facts stated.

EDITOR COTTON:

In the discussion on the twist inserted in the yarn on the ring frame, no one has yet stated what I consider to be the real function and relation of the spindle and traveler.

In my opinion, the spindle inserts the twist, while the purpose of the traveler is to provide tension for and control the traverse of the yarn, thereby making a hard and well formed bobbin.

For a practical test, piece up an end on a twister without hooking it under the traveler. Of course it will balloon and break in a short time, and the yarn that has been wound on will be twisted, but in a loose bunch at the top of the spool. The traveler has been idle and still there is twist in the yarn.

"J. F. C. (R. I.)" in his letter in the March edition, reaches the correct conclusion but I can't follow his demonstration. First, he says that a change in the twist gear will alter the speed of the cylinder. I think if he investigates, he will find that changing the twist gear, changes the speed of the front roll and that the speed of the cylinder is changed only by altering the driving speed.

Later he says that the r.p.m. of the bobbin, subtracted from the r.p.m. of the spindle, will give the r.p.m. of the traveler. If he has bobbins that run slower than the spindle they must be slipping.

If "J. F. C." will take a concrete example and figure it by "his little rule," I think he will find the result to be considerably different from what an actual test would show.

W. E. F. (Calif.)

The Use of Loom Supplies.

EDITOR COTTON:

I note with a great deal of interest in the April issue of COTTON the discussion on loom production and supplies. Of course the conditions have a lot to do with either, but on fair conditions a print cloth loom should produce a production of at least 95 per cent, but this will mean staying after it. This does not mean starting the looms up ten to fifteen, and even twenty minutes before the regular starting time, nor does it mean for a week; it means for months' averages. Take your yearly average and see how you tally up and if you beat 95 per cent, your per cent second quality will not exceed 5 per cent, because a loom that will run that high a percentage of production is in good shape and is making good cloth. When you speak about 97 per cent production, you are getting up pretty high on print cloth numbers and we must take into consideration that the warps have got to be just as efficiently dressed as the looms are repaired—the two must be in harmony with one another.

As to the repairs on the looms, that depends on whether you are keeping them repaired, and what is charged to loom supplies. I've worked at places where the belting and several other things used on looms were not charged up to the looms; that went in as general supplies. All this has to be reckoned with. My costs per hundred looms per month, and this is everything that went on the looms, nothing excepted, and also the average for the last four months, I never went back any farther, although if I get criticized too severely I may go back and get some other four months' averages, but this is the first four months of this year, ending April 30th, was $64.01 per month. This is the average of 1,800 E model looms and also includes the oil used on the looms. Now if this is out of reason, let

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me hear from some others, that I may improve my cost per hundred on loom supplies. I am glad this question has come out; it looks to me like we have stayed out of the weaving too long, especially on loom supplies. Just shut your eyes, and dream of the scrap-iron pile! What do you most commonly see in your vision? Weaving scrap, more than ten to one of any other room. Of course this is customary, and will probably always be more, but the idea is, can't we talk about it enough to cause us to take more pains in saving the supplies that we put on, put them on better, see that the looms are properly set before the fixer leaves them, and if a loom breaks a part, when we replace the broken part don't start it up and let it break another part in order that we may locate what broke the first piece. If this had not happened to my knowledge I would not probably have thought of it, but I have seen loom fixers just that indifferent. Of course that's been some five or six years ago, but I expect we still have some of the same class with us today if we will only keep close tab on their supply account.

We keep each loom fixer's supply account separate, and at the end of each month run it up and make comparisons, giving each one a list of the others and by doing this they see who has the best account, and it creates quite a rivalry between them at times. Some mills try to keep the loom accounts by charging off from the loom supply invoices and taking the averages.

Regarding the amount of waste on the warper beams behind the slashers, the best average we could get on 30s warp, running from 1,500 to 2,000 ends, was from ½ to ¾ of a pound per beam.

Changing the slasher jackets at the size boxes depends a great deal on the kind of sizing compound that many use. Some have more chemicals than others that tend to eat up the cloth faster; then the speed of the rolls has something to do with it. We usually watch them and use them as long as we can and not damage the yarn. We have a water hose at each size box and it adds largely to the life of the blankets by keeping them washed each night. By doing this we get nearly a week's service from each blanket. T. A. D. (Ga.)

The Ribbon Lap Machine.

EDITOR COTTON:

There isn't very much that can be said about the ribbon lap machine other than what can be said of any process where the drafting of or the drawing of the fibers takes place—such as the sliver lap machine or the drawing frame or any machine that has drawing rolls. The object of this machine is to present a web in the form of a lap to the comber that is soft and pliable, free from flake, bunches and a texture that can readily be held fiber for fiber between the jaws of the so-called nipper frame. To accomplish this one cannot be too careful in producing an even sheet from the sliver lap machine that can be handled at the ribbon machine. The same stumbling blocks are usually met with at the ribbon machine as are met with at the sliver lap machines, namely, roll setting, bulk, tension, etc.

First, the weight of the lap per yard must be considered, for with a weight that no rolls can possibly draw, 'twould be folly to attempt to describe any operation that would possibly be able to take care of such. Always remember that the weights hanging on each roll and the spread or space between these rolls are the only things that will insure you against future troubles in yarn manufacture. We all know that heavy yardage is proper where combing processes are used, such as Kirschner beaters, cards and combers, and that light yardage is quite the proper thing where a drawing process is in operation. So from that standpoint always keep in mind that while you are trying to adhere to a 1½-inch draft in the sliver lap machine that a lap not too heavy from the sliver lap machine is essential for good work from the ribbon lap machine with 3½ inches to 4 inches draft. At the same time, in favoring the drawing processes at the sliver and ribbon lap machines, bear as near the margin as possible to the heavy side in order to create as long a draft as possible in the combing operation of the comber, and not leave a tremendous draft to be applied at the draw box of the comber in order to say that the comber has a long draft. Make the long draft take place at the combing point(the half lap). The speed of the ribbon lap machine should be figured from the 5-inch calender roll at the head. Never run any ribbon lap machine more than 23 per cent faster than the actual speed requirements of 8-6 head or 6-8 head combers require plus the waste.

The distance between the first and second rolls must be kept as near to the staple as possible. This doesn't mean that one must set these two rolls *exactly* to the length of staple being used, it simply is another place and case where common horsesense must predominate. And then the third roll must be removed far enough away from the second roll to allow for what I term tension setting; that is to say, when the end of a ruler is placed upon the cotton between the rolls, upon slight pressure the cotton will give way. Then proceed to the fourth roll and use the tension setting there. This method of setting rolls is at times a little more troublesome while trying different distances to determine the correct setting required, but when the proper distances have been found, the results from the efforts are so gratifying that you surely will be amply repaid for all your hard work. Then look well to smooth curved plates and clean polished sliver-table; remove all excessive tension and adjust the lap head so that there will be a perfect lap made. Get the weight per yard as described and go ahead. A. B. C. (R. I.)

Watch the Roving Traverse.

EDITOR COTTON:

One day I was being conducted through a mill of which one of my close friends was superintendent. When we got back to the office my friend said to me, "Well, boy, what do you think of my job here? You see, there is only one thing I haven't been able to remedy as yet, and that is unevenness in the roving and yarn. I have looked all over for the cause—I've had tension gears changed, lay gears changed, flyers balanced, spindles plumbed, frames lined and leveled, new rolls put in, steel rolls refluted, and it seems that none of these things help me with the unevenness of the work."

"Well," I asked, "have you ever looked over your roving traverses in both the carding and spinning departments? This can happen in carding: First, roving tra-

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verses on slubbers, in years of running and for lack of oil and attention, become worn and stand still for a few seconds at each end of the stroke, and while it is still, or dwelling, the roller, which has a cloth cushion on it and a leather cot, becomes creased and fails to grip the mass of fibers that are in the sliver. This causes an uneven draft resulting in thick and thin places. This is a very common evil. Suppose the thick and thin places are two or three inches long at the slubber. Multiply this by the draft of the intermediate and speeder or jack and the spinning frame, and see where you are. With an intermediate draft of 5 and a speeder draft of 6 and a spinning draft of 7.50, which gives 3 (inches) $\times$ 5 $\times$ 6 $\times$ 7.50 = 675 inches thick or thin at the spinning frame. Suppose each machine made three inches thick or thin places in the roving!

"The roving traverse in both the carding and spinning departments needs very careful attention at all times. A good thing is to have the machines numbered and have each section man overhaul two roving traverses along with the other adjustments he makes five days a week. This will put ten frames in condition each week. Let the overseer keep a record of this work in a book and report it to you, and then your superior knows your attention to your department. I am a strong believer in following up the game, in knowing the defects in my department, and in rectifying them before they become too serious.

"If you have backlash in your roving traverse, just simply take a small coil spring used on loom harness and fasten it to the cap bar or stand, and hook the other end to the traverse, which will keep the cam in contact with the cam fork and prevent the traverse from dwelling and creasing your rolls and making uneven roving or yarn. This just costs a trifle. Try it." A. B. (Ga.)

Is an Evener on a Breaker Lapper an Advantage?

EDITOR COTTON:

I would like to see discussed in "How Other Men Manage," the following question:

What would be the advantage of an evener on the breaker lapper, if the laps could be made to weigh as good on the average as laps off the finisher lapper? Would this decrease the variation in yarn spun from these laps over the regular system of breaker lappers? If so, why? What other advantage would there be in equipment of this kind? Bob (N. C.)

A summer book, recently issued by the Southern Railway System, attractively illustrates and describes the recreational opportunities in the southern Appalachian mountains, served by this railroad, particularly the "Land of the Sky" section of Western North Carolina. Copies of the booklet can doubtless be procured upon application to any Southern office.

Newport Chemical Works, Inc., Passaic, N. J., announces the addition of two new colors to their products: Newport Direct Red 3XB, a bluish red for cotton, silk or artificial silk; and Newport Chrome Green GCM, a product for dyeing wool by chroming methods. The former is said to be of fair fastness generally with perfect discharging qualities, and the latter, says the announcement, has good fastness to fulling and light.

Georgia Mill Men Meet at Atlanta.

(*Continued from page* 817.)

able—that such a course would provide an ideal hedge. Why not resort to the *reductio ad absurdum* and confine the contract to one grade? In theory that would be ideal but in practice the buyers in number would so far exceed the sellers that the whole would come to naught.

"There can be no future contract system that will provide a successful hedge that does not embrace practically all of the desirable grades produced. Any restrictive legislation in that direction may only be likened to the experience of the man who experimented with his mule. Just as he reduced its food to a minimum consistent with economy and good work the mule died, and so it is with the future contract; reduce its scope to a point where it is uniform in accordance with spots, destroy the element of future possibilities or probabilities and the system with its hedge advantages will be destroyed.

"All of the legislative brains of the country combined as one can not legislate values into cotton or any other article of trade or barter, nor can it prevent progressive people of our country from forecasting their views of the future. You may bring a horse to water but no power on earth can force him to drink, and so it is with the brains and intelligence of our people. It is possible to circumscribe their acts but it is not possible to control their thoughts."

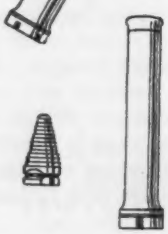
After Mr. Plauche's address, C. B. Howard, general sales manager of the American Cotton Growers' Cooperative Association, outlined the methods of that organization in handling the cotton for farmers on a cooperative basis, and made an appeal to the mills for their support in the work.

At this point on the program Judge Charles Adamson, of the Cedartown Cotton & Export Co., was scheduled for an address on the tariff. In his absence, because of lack of time the paper was entered in the record and the suggested resolution tabled for future action by the Executive Committee.

The president next appointed the following committees, to report at the evening session: Nominating: F. B. Gordon, W. J. Vereen, L. M. Jordan; Resolutions: L. L. Jones, A. G. Dudley, D. W. Anderson, C. M. Walker, L. M. Jordan and L. G. Hardeman. The morning session was adjourned at this point, and the members enjoyed a delightful luncheon following which a golf tournament was held in the afternoon. This was in charge of Chip Robert and L. W. Peabody. Two prizes were awarded, one for the individual low score and the other to the team representing a town. The winners of these, as announced after the tournament were: Harold Callaway, of LaGrange, who took the individual prize, Robert Hightower, of Thomaston, being the runner-up. The Rome team, consisting of John S. Bachman and his son, won the team trophy.

At a called meeting just prior to the dinner in the evening, Clarence Ousley, of the National Association for Boll Weevil Control, spoke briefly, telling the mill men of the aims and purposes of his organization.

The *piece de resistance* of the convention, from the social standpoint, was the annual banquet held in the evening. Frederick B. Gordon acted as toastmaster, which assured its being a success. After the meal, Mr. Gordon called upon the past-presidents of the Association who were



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present for a word of greeting and reminiscence. Among those speaking were B. S. Walker, the first president; Mr. Gordon, the second president; Dr. Jeff Davis, third president; W. J. Vereen, J. A. Mandeville, Cason Callaway, Lee M. Jordan and P. E. Glenn. Other presidents mentioned by Mr. Gordon, who were unable to attend, were Allen F. Johnson and D. A. Jewell. The memory of other two president, the late C. D. Tuller and R. C. Freeman, was recognized by the entire body standing in silence for a moment.

Judge A. W. Cozart entertained the diners with a humorous talk, which was followed by an address from Hon. Clifford Walker, governor of Georgia.

At a short session held after the banquet, George S. Harris, of the Exposition Cotton Mills, Atlanta, was elected president of the association; S. Y. Austin, of the Hillside Cotton Mills, LaGrange, was made vice-president; W. M. McLaurine, secretary; T. J. Callaway, treasurer, and C. W. Chears, traffic manager, were re-elected to these positions. Resolutions were also adopted at this session, which included expressions of regret at the passing of Messrs. R. C. Freeman, C. H. Williamson and J. D. Massey, members of the association, during the past year, and also upon the death of James D. Hammett, president of the Cotton Manufacturers' Association of South Carolina.

Some Weaving Questions.

EDITOR COTTON:

Will you ask the readers of the discussion section to work out the following questions so I can understand just how it is done?

A warp contains 2,352 ends of 40s yarn drawn 2 per dent in a number 36 reed, plus 40 selvage ends of the same counts, drawn 4 per dent. The filling is 48s yarn and 80 picks per inch. (a) How many yards of warp will be required to produce 100 yards of cloth if the contraction is 4 per cent in the weaving? (b) What will be the weight of the warp yarn in 100 yards of cloth if 5 per cent of size is applied to the warp yarn? (c) How many pounds of filling yarn will be required to weave 100 yards of cloth? (d) What is the weight expressed in yards per pound of this cloth?

How many pounds of warp yarn and how many pounds of filling yarn must be spun to fill an order for 75,000 yards of cloth? Counts of warp 60s; ends in warp, 3,160, plus 80 selvage ends; warp contraction in weaving, 3½ per cent; reed. No. 40; body of warp drawn, 2 per dent, and selvage drawn, 4 per dent; counts of filling, 80s; picks per inch, 90. B. C. (N. C.)

Another Question for Weavers.

EDITOR COTTON:

I note in weaving denims with a left hand twill that the twill is much more pronounced on the surface of the cloth, and also that the surface of the cloth is much smoother, and the stray fibers in the yarn are shown to a lesser degree than is produced by the use of a right hand twill.

Will some of the readers of your discussion department enlighten me on this subject, and explain what principle of weaving governs this case? Contributor 99.

Texas Textile Men Meet at Waxahachie.

(*Continued from page* 812.)

and pull out the light sliver and make white waste out of it."

"Do you know what per cent light it has to be before the spoons will knock off?" Mr. Tatum asked. "It doesn't have to be very much," answered Mr. Moak, "for if you keep the spoons clean, a very little will trip them."

"Over in Mississippi I was in charge of the spinning room and we had a great deal of trouble with numbers varying," said Mr. Whetstone, "but we could not find the cause. Later on I took charge of the carding also, and in weighing my sliver I noticed that sometimes I got a big variation, and by sizing before and after stripping, I found out where it came from. I found that just after stripping I would have a variation of three or four or five grains. We had the vacuum card stripper, and they were not stopping the card to strip it. I stopped them from that. We took the end down and stripped the card out, and when the stripper was stripping the next card he would start the end through and let it run and afterwards come back and put it up. We did not have so much variation in our card sliver after that and our numbers gradually got better all the way through."

"We run 105 hours a week and strip four times a week," said Mr. Cain, "using the fancy stripper. While we are stripping we strip our first cards and start them up and the sliver goes on the floor, and they strip the next one and then come back and put up those ends." Mr. Cain had a brief discussion here with Mr. Bradford concerning the merits and demerits of the fancy stripper. Mr. Cain seemed to be the only one in the meeting who approved the use of this equipment, however.

The Murray cleaner was the last thing to be discussed at the meeting. The chairman called on Mr. Wilson, of Cuero, for his experience with this machine.

"We are very much pleased with the Murray cleaner," responded Mr. Wilson. "We are getting more dirt out, and it has improved our grade in our mixing about a half a grade."

Mr. Compton said they were pleased with the machine at Gonzales, as they got a much better mixing of their cotton, and were able to take out about two teeth of twist with about the same cotton.

Here Mr. Tatum reported the results of a comparative test made by himself at Bonham and Mr. Compton at Gonzales. "At Bonham," said Mr. Tatum, "we have two vertical openers in tandem, with grid bars, and five sections of English cleaning trunk. At Gonzales Mr. Wilson has one vertical opener with the old perforated screens and the Murray cleaner. The test was made on the same grade of cotton, using six bales in each test.

"Compton got out 22 pounds on his single vertical opener with perforated screens. We took out 45 pounds in the first vertical opener with grid bars, and 26 pounds in the second vertical opener.

"He got 24 pounds out in his Murray cleaner, and we got 13 pounds out of our five sections of English cleaning trunk.

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The best judges in the world of what Bondaron Harness Straps can save a mill are the executives of the mills where these straps have been tried.

Do they approve Bondaron? We have proof that they do. One mill, after preliminary experiments, ordered over 50,000 Bondaron Harness Straps within three months. Needless to say it was a large mill. Needless to say, also, the executives knew what they were doing.

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Bondaron is a remarkable tannage, different from any other known. It has phenomenal records of endurance in service on textile machinery.

Write us for further information and arrange to equip some of your looms with Bondaron. We use the same tannage for practically all loom leathers—check straps, lug straps, and so on, with equally striking results.

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Wherever possible to use cup grease around the plant—on pumps, engines, shafting and other machinery, Dixon's will give bteter lubrication at lower cost.

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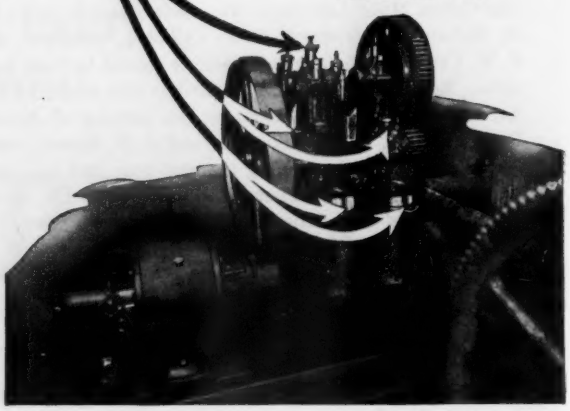

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ON JUNE 6TH 1916 THEY PURCHASED 1 ROOT PICK COUNTER
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If you will equip but one loom now you will within a few months do likewise—become a large user. They count accurately the number of picks.

May we send one for test?

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Have you seen the Double Pick Counter made by Root?

"He got 28 pounds out of his breakers; we got 21 pounds.

"He got 12 pounds at the intermediates; we got 7 pounds.

"He got 8 pounds at the finishers; we got 6 pounds.

"These figures show we took out a total of 118 pounds, and he took out 94 pounds. Our percentage was 4.22 and his was 3.55, which shows we got out 25 per cent more pounds than he did. I think we made a mighty fine improvement when we threw out the perforated screen and put in the grid bars."

As a concluding item, a member asked the number of rolls used for spindle per year. Mr. Tatum reported from an answer to the questionnaire, which stated that one mill used three to four cots per spindle per year, or just half that many rolls.

Following the Saturday morning session the men were taken for a pleasant automobile trip around Waxahachie, after which they reassembled for a luncheon at the hotel, where short talks were made by several visitors, and a delightful musical program was enjoyed. The election of officers was held at this time, with the following results:

For President, W. H. Gibson, of Waxahachie, succeeding Mr. Tatum. For First Vice-President, J. O. Wilson, of Cuero, succeeding S. C. Cain. For Second Vice-President, Grover C. Dilling, of West, succeeding J. R. Compton, of Gonzales. Dan H. Poole, of Sherman, was unanimously re-elected secretary-treasurer.

Waco was selected as the place for the next meeting, upon the urgent invitation of Hugh S. Clarke and Mr. Neeley. This meeting will be held some time in the Fall of this year. After the transaction of this business the convention was declared adjourned by Mr. Gibson, the new president.

V. C. WILSON, for several years master mechanic for the Mollohon Manufacturing Company, Newberry, S. C., has accepted a similar position with the Erlanger Cotton Mills Company, Lexington, N. C.

H. M. MAPLES has become overseer of spinning at the Wade Mfg. Company, Wadesboro, N. C.

HOLLIE STILL has become overseer of carding at the Addison Mills, Edgefield, S. C. He was formerly with the Greenwood Cotton Mills, at Greenwood, S. C.

A. F. N. THOMAS, sales manager and advertising director of the Mathews Gravity Carrier Company, Ellwood City, Pa., died suddenly on April 27th. Mr. Thomas became associated with the Mathews Gravity Carrier Company on January 1, 1912, and in 1916 he assumed the added responsibility of manager of sales, and served the company in this dual capacity until the time of his death.

KENNETH M. HESS, commission agent, 105 Worth Street, New York, has been appointed sales manager for the Maginnis Cotton Mills, New Orleans, La. He will be located in New Orleans, and have entire charge of the distribution and sale of the products of this mill, which are sold direct to the trade. The New York office of the Maginnis Cotton Mills is located at 350 Broadway, in charge of R. L. Stebbins. J. C. Kinnier, who has been associated with Mr. Hess, will take over and continue the business of Kenneth M. Hess at the same address, 105 Worth Street, in Mr. Kinnier's own name.

W. F. SMITH has been made night superintendent at the Perkins Hosiery Mills, Columbus, Ga.

Fluidity and Viscosity of Starches.

(*Continued from page* 800.)

As temperature affects viscosity measurement it is absolutely necessary that comparative tests always be made with the fluids at the same temperature.

Starches are bought in dry powder form and must be weighed and dissolved to make them fluid for the test. The residual moisture of starches may vary from practically none to twenty per cent, or more; the starch sample must therefore first be tested to determine the moisture, and due allowance made for the water content. The samples must then be accurately weighed, with proper allowance for the water they contain and then dissolved in the proper amount of water. Solution may be effected either by heating or by the addition of chemicals. If chemicals are added to the water used for dissolving the starch, the proportion of chemical must be accurately measured. Another factor of great importance to be reckoned with is that so-called starch solutions are never true solutions. They are really mixtures of partially dissolved starchy matter in suspension in that portion of the starch which has dissolved. Futhermore, the suspended and undissolved portion is of skeleton-like structure. These skeletal forms impede the flow of the starch solutions, and too vigorous stirring of the sample under test will break up this skeletal structure, change the rate of flow, and thereby affect results. Care must, therefore, be exercised, and even the amount of stirring must be regulated.

There are several methods of preparing the sample for the viscometer test:—A 5 per cent or 10 per cent solution of starch, according to whether the starch be thick-boiling or thin-boiling, may be made by heating the starch with water until it is dissolved under conditions that may be duplicated. This method more closely approximates the condition under which the starches are to be used than the method next to be described.

Another method, one that uses chemicals for dissolving the starch, is given in the "Journal Society of Chemical Industry 1907," page 501; see also the originator's book, "The Materials Used in Sizing, their Chemical and Physical Properties," by W. F. A. Erman, of the Manchester School of Technology, from which the following is taken: —Three-fifths grammes of starch are washed into a 250 cc graduated flask, with the aid of 230 cc of cold distilled water. Fifteen cc of exactly 10 per cent sodium hydroxide solutions are then rapidly run in from a burette, and the flask is filled up to the mark with distilled water and is shaken gently, but continuously, until the starch has gone into solution, after which it is allowed to stand for twelve hours. Finally, the viscosity of the solution is measured in the viscometer."

Erman further says: "In order to obtain concordant results, the strength of the caustic soda solution should be exactly 10 per cent, as even a small variation will give a different viscosity. Every time that a delivery of starch is to be compared with the standard, solutions of both standard and delivery should be tested. The solution should at all times be agitated as little as possible, and the solution that has run through the viscosimeter should not be used again. A small rise in temperature causes a considerable lowering of the viscosity; consequently care must be taken to insure constant temperatures during the time

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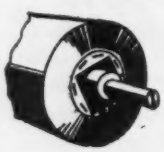

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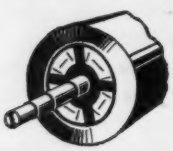

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of the tests."

The foregoing makes clear why it is difficult for two different operators to obtain the same results on starches. Each operator may be able to get duplicate and concordant figures which enable him to form accurate conclusions as to the similarity or dissimilarity of the several samples of starch, but the same sample of starch tested by two different operators may not give the same test figures. They may have used different methods and different instruments. It is evident, therefore, that the starch manufacturer must surround his tests with every aid to precision or he cannot deliver successive lots of starch, of uniform fluidity or viscosity.

The same instrument and the same method of determining viscosity might be used by every starch manufacturer or every chemist, but even if this were so, which as a matter of fact it is not, the arbitrary features of manipulation, as, for instance, the stirring of the sample, may give somewhat varying test figures. The point to be borne in mind is that the same operator, working under the same conditions, will get the same results. Fluidity or viscosity figures are, therefore, arbitrary expressions, and must be compared to a type. The figures denote measured relative freeness of flow.

To sum up the foregoing, note, then, that "30 fluidity" on a brand of starch means: (a) that a given volume of liquid will flow in 30 seconds; (b) that in a specified unit of time, 30 cubic units of liquid will flow. The same applies to other figures used, such as 50 fluidity, 70 fluidity, etc. All such figures are arbitrary, and refer to the reading given by a particular measuring instrument and a particular routine of procedure. Water will show a different figure for each instrument. Such figures should be recognized as "arbitrary viscosity or fluidity" figures applying only to the specific instrument and the particular set of conditions used for preparing the sample. Arbitrary viscosity figures do not admit of accurate comparison. Specific viscosity figures are obtained by dividing these arbitrary figures by the figures obtained for the flow of water under the same conditions in the same instrument. Specific viscosity figures do admit of accurate comparison.

Starch solutions are unstable. There is a continuous change of the very important property of viscosity, due to change of temperature, to chemicals added to the size kettle, and to greases and size compounds used.

It is characteristic of the root starches, like arrowroot and potato starch, and also of sago starch, which happens to be neither a root starch nor a seed starch, that their solutions lose viscosity by boiling very much more rapidly than starches from the cereals, barley, rice, wheat or corn. Harrison in his article on "Measuring the Stiffening Power of Starches" corroborates this statement relative to the greater sensitiveness of root starches by reporting his experiments with potato starch as follows: "The results for potato starch heated by the naked flame were very variable, since a solution having a viscosity of 250 had the viscosity reduced to 50 by shaking for one minute at 16 degrees and to 20 by shaking to the same extent at 90 degrees C. It is evident that the unequal boiling of the solutions accounted for the great variations in the results. The peculiar maximum viscosity after heating for 15 to 25 minutes is of practical importance in the preparation of finishing pastes."

All starch solutions are, therefore, at their maximum viscosity in from 15 to 60 minutes after reaching the boiling temperature. After having reached their maximum viscosity the starch sizing solutions become thinned by continued boiling or other agitation, primarily by reason of the cell sacs being broken down. After these are all broken down the further loss of viscosity will be very gradual unless chemicals are present, or water enters the vessel from the steam used for boiling. Maintaining starch solution at or above the boiling temperature will increase the amount of starch that goes into solution, and therefore adds to the adhesive quality. It will, however, lower the viscosity and therefore the amount that will cling to the yarn, thus necessitating a fortifying by increased percentage of starch or by adding something of a viscous gummy character to increase the viscosity.

Where a newly-made batch of size is to be added to that already in service, they should not be mixed together in the size box. Notwithstanding the proportions of starch to water may be the same, the two solutions will differ widely in viscosity. They should, therefore, be blended in by adding the new to the old in a blending kettle, and the combined new and old size should be added continuously rather than intermittently, to the size box. This avoids a sudden or wide change in the viscosity and thereby keeps the amount of sizing applied to the yarn more uniform and even.

The natural or unmodified starches differ widely, not only in respect to their sensitiveness to thinning by long boiling, but also in respect to their rate of congealing when the temperature of their solutions falls below that of boiling.

Some starch solutions when of the density and viscosity suitable for sizing, lose their fluidity and set to a jell state immediately upon a fall of temperature from that of boiling to 180 degrees F. to 160 degrees F. Other starch solutions at the same concentration will remain fluid for a much longer time, even though the temperature be reduced to 150 or to 130. This difference in behavior depends upon the nature of the starch, its source, and the amount and kind of processing by the manufacturer, and also upon long boiling and the amount of grease and size compounds that have been added during boiling. Solutions of thin-boiling starches congeal more slowly than thick-boiling, hence their increasing peculiarity. Just how much slower depends upon the nature and amount of conversion to which the starch has been submitted. Best sizing results accompany slow-congealing size.

The size in the size box may be boiling and have a temperature of 210 to 212, but by the time it leaves the nip of the last squeeze roller the temperature may have fallen to 170 to 160 or lower. This is of moment in connection both with loss of fluidity and also of adhesive value from starch going out of solution at the lower temperature. Obviously then that starch will yield the best sizing, which, while its solution is sufficiently viscous and concentrated as to apply a sufficient amount of sizing to the yarn, yet will congeal so slowly with fall of temperature as to remain fluid at the low temperature of the last squeeze rolls.

It is the author's judgment that the size should be kept at the boiling temperature, but violent boiling should be avoided. Violent boiling robs the size of viscosity. What is desired is the high temperature of boiling and just enough

agitation to keep the size rolling over so that the temperature may be nearly uniform as possible in all parts of the size box. A size box jacketed by boiling water so as to hold the temperature, and by this indirect method of heating avoid the water of condensation resulting from the direct injection of steam, would be a decided improvement in slasher equipment. The advantage of hot water over steam in the jacket is that hot water will not cause scale formation, which is almost unavoidable where steam is used in the jacketed size box.

Contrary to the generally accepted theory, the application of starch sizing to yarn is really a superficial deposition of the starch size upon the surface of the fiber, rather than a penetration into the core or substance of the yarn. There is little, if any, penetration of size between the fibers of the yarn reaching toward the center of the yarn and certainly none into the fiber itself.

There is, however. much of fundamental importance to what is generally spoken of as "penetration." Penetration so-called is in reality a flowing of the size into the pockets of the fibers on the surface of the yarn and a levelling off of the surface, just as a good paint or varnish if it congeals slowly will level out and cause the brush marks to disappear. In like manner a slow congealing size will level itself to a smooth surface, and by flowing into the recesses will bond itself better to the yarn. If, on the other hand, the size is insufficiently boiled and not freely fluid and sets to a jell too quickly, poor sizing and consequently poor weaving is the result. The anchorage of size is therefore in no case assisted by rootlets, if for the purpose of illustration we may use the term rootlets of size, extending between fibers to the core of the yarn. The anchorage is dependent upon the size flowing into the pockets of the surface fibers. English cotton mills formerly fermented wheat flour and by fermentation brought about two results. Fermentation not only separated the starch and destroyed the gluten, but it also brought about a thinning action and also gave slow congealing size, greatly improved as to adhesiveness and smoothness when dried on the yarn.

Starch is extremely sensitive to acids. Any trace of acid not removed by the manufacturer, or acid that may be formed by fermentation or souring, lessens the viscosity with extreme rapidity at the boiling temperature of the size kettles. Alkali, on the other hand, thickens the starch solution by dissolving a portion of the amylopectin. Certain chemicals other than acid and alkali, such, for instance, as zinc chloride or calcium chloride, affect the viscous character of the starch solution. This thinning effect continues as long as the chemical is present. The result is a continuing change in the viscosity or fluidity of the size. Chemicals in the size kettles are, therefore, dangerous and should be avoided.

In theory, it is possible to add certain chemicals to the starch in the size kettle and convert the unmodified, thick-boiling starch to the more serviceable thin-boiling type, and save money by so doing. In practice this does not work out, for the simple reason that no set of conditions such as percentage of chemical, ratio of water and starch, time, and temperature, all of which are important factors, cannot be positively controlled without the services of a chemist, and even if they were accurately controlled, the results would not be uniform, since different lots of starch react differently, due to variation both of maturity of growth of the starch granules and to impurities always present in the crude starches.

Glycerine adds suppleness and strength. A substance like glycerine has not only the advantage of harmlessness, but if present in sufficient amounts prevents the over-drying of the warp by the slasher man, with the advantage that the warp is immediately ready for good weaving. Warps containing glycerine do not have to wait for regain of moisture from the air. It should be kept in mind that when glycerine is used an antiseptic must be added to avoid danger of mildew.

With perfectly dry warps there is no danger of mildew, but with a damp warp the danger of mildew is present. It takes a skilled slasher man to avoid either too dry a warp, which means brittleness of the yarn, or too damp a warp, inviting mildew. Between 6 to 8 per cent moisture left in the sized warp yarn with an antiseptic present to prevent mildew, is the best practice. The warp will be stronger, the yarn will be more pliable and will weave better and the danger of mildew is avoided.

There are only a few antiseptics entirely suitable as preventives against mildew. The best of these are, possibly, thymol, resorcinol, naphthalene, benzoate of soda, benzoic acid, and cresol. Three ounces of any of the above to each 100 pounds of starch is effective as a preventive of mildew. If boric acid is used as an antiseptic, approximately 20 ounces are required as the equivalent of 3 ounces of benzoic acid. Six ounces of formalin is effective for immediate sterilization, but as formalin is a 40 per cent acqueous solution of formaldehyde, the latter being as gas, this active substance, formaldehyde, disappears on drying the yarn, and is lost, so the protection of the warp against mildew during the stay of the warp in the weave room is lost.

The following are less favorable antiseptics: Alum is objectionable, because acid, and thins the size. Copper sulphate, blue stone, behaves much like alum, due to its acid effect. Borax is objectionable because alkaline; it darkens the size and affects unfavorably the wool blanket. Zinc chloride, acid reaction; thins size, injurious to fiber. Corrosive sublimate, extremely poisonous; its usefulness is destroyed by brass or copper. Cresol, objectionable because of odor. Salicylic acid, turns size pink to red, with traces of iron. Formaldehyde vapors arising with steam are irritating.

The Size of a Dust Room.

EDITOR COTTON:

In the April issue, "M. B. R." asks the writer and others to discuss the different sizes of the dust chamber.

The speed of the fan has nothing to do with the subject.

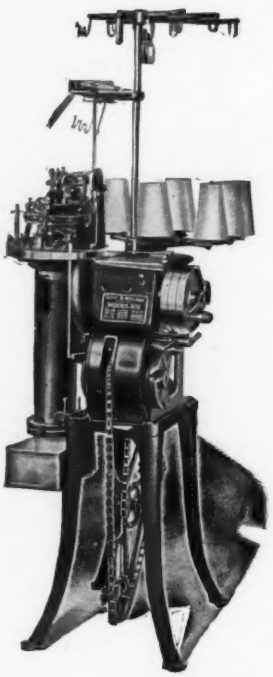
When equipping a picker room, one should see that the combined area of the fan outlets cut in the floor, leading to the dust flues does not exceed that of the dust flues themselves, because if it does, the production of a ragged, uneven lap will be the result. The only way to find out if the dust cellar is large enough is first to learn the amount of foreign matter in the stock run. The foreign matter must clear the outlets cut in the floor, that is all there is to it. The writer has had dust rooms 100 x 100 feet and the present one for a large mill is only 30 x 30 feet.

Wash (R. I.)

KNITTING SECTION

NEW MODEL H-H

Producing Ribbed Top Half Hose Complete



Ribbed top made on two sets of needles.

Automatic transfer from ribbed stitch to plain.

Eliminating necessity of skilled help.

Saving of raveling waste which occurs when topped by hand

Each stocking is dropped from the machine when finished.

Each stocking is automatically started upon the empty needles, producing a French welt without drawing thread or cutting, no ends of any kind to be removed.

Machine is fitted with five yarn fingers.

Provision is made for high spliced heel and double sole.

Provision is made for ring top and ring toe.

Needles without rivets or latches.

Speed of machine about the same as Model K.

Production about twelve stockings per hour on 3¾" 220 needles.

One operator can take care of the same number of machines as Model K.

The machine is built in all gauges.

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We believe that the operatives in New Bedford are the highest paid cotton mill operatives in the United States.

Only the very best operatives can make the very best of yarns and the very best workman everywhere gets the highest wage. The Quissett Mill was erected, equipped and has been operated on a quality policy only and we are glad to pay the highest wages to secure the best operatives so that we can continue to produce only the highest quality cotton yarns both carded and combed.

Well paid operatives are cheerful operatives and profitable operatives—they do good work, they get good production and they are careful. The policy of the Quissett Mill has never been how cheap—but how good.

Our mills are open to any yarn buyers—we would be glad to show our operations, our equipment and our personnel to any prospective customers who are interested in highest quality yarns.

Carded and Combed Cotton Yarns in all Numbers, and Descriptions. Ply Yarns our Specialty, Egyptians, Sea Island, Peelers, Sakelarides.

Quissett Mill

New Bedford, Mass.

Wm. M. Butler, President, Edward H. Cook, Treasurer, Thos. F. Glennon, Agent

QUISSETT MEANS QUALITY

A Small Circular Ribber

BY G. R. MERRILL.

The following is a discussion of a small circular ribber. Machines of this type are practically used for making rib legs for infants and children's stockings, rib cuffs for men's half hose and rib tops for women's full hose. The usual articles are all one color and very simple in construction.

The upper end of the ribbed article is generally finished with one or more welts. These welts are usually made with a combination of tuck stitch on the dial needles and idle dial needles (while the cylinder knits). The lower part of the ribbed article has a loose course from three-eighths to one-half an inch from the end. This loose course is formed by forcing the cylinder needles to a lower level than usual for one course. The fabric between this loose course and the end is known as transferring courses because it is put there in order that the girls transferring these ribbed articles to other machines may have some fabric to hold.

The machines consist of a hollow cylinder slotted on the outside to hold needles and smoothly finished on the inside so that the knitted fabric may pass freely through. Around the cylinder is a ring, the inner side of which carries a series of cams. The cams fit quite closely to the cylinder and control the cylinder needles by their projecting butts. Figure 1 shows one-half of the cylinder cam ring and the cams which actuate the needles during knitting. The other half of the cam ring has no cams and the needles are left at the level shown at either side of the diagram. The arrow indicates the direction in which the cams move.

Above the cylinder, but quite close to it, is the dial. The dial is a round plate concentric with the cylinder. The upper side is slotted on radial lines to hold the needles in a horizontal position at right angles to those in the cylinder. Above the dial, close to it and concentric with it are the dial cams which are held on a small circular plate or cap. The outline of these dial cams is shown in Figure 1 and the arrow indicates the direction in which they turn. The raceway formed by the dial cams controls the butts of the horizontal needles. The entire circle of dial cams force the dial needles to the extreme outermost half circle of the cylinder cam ring not shown. As the raceway in the upper half of the dial cam diagram is nearly a perfect circle, the horizontal needles are held in practically the same position while controlled by this section. This means that for one-half of the cams both cylinder and dial needles do not move.

On Figure 1, indication is made of the points on the cylinder and dial cams which work together. This serves to show that the cylinder cams raise the cylinder needles to the highest point at approximately the same time that the dial cams force the dial needls to the extreme outermost position.

The length of stitch made by the cylinder needles is controlled by the position of cam A. This cam is carried on a post, the lower end of which rests on a spring. This spring tends to keep cam A at the highest position possible. The upper end of the post is held down by a machine screw. So, by turning this screw down, A is forced farther down and by backing the screw out, A is raised by the spring. As cam A is forced down it carries the needles farther down and so draws a longer loop of yarn.

The length of stitch made by the dial needles is controlled by the position of cam B. This cam is forced in by the set screw shown at the side (Figure 1). It is forced out by pressure of the dial needle butts. As B is forced in it carries the needles nearer the center and so draws a longer length of loop.

Cam C is the welt cam and may occupy the positions shown in the full lines and dotted lines and a third position about half way between. When in the position shown

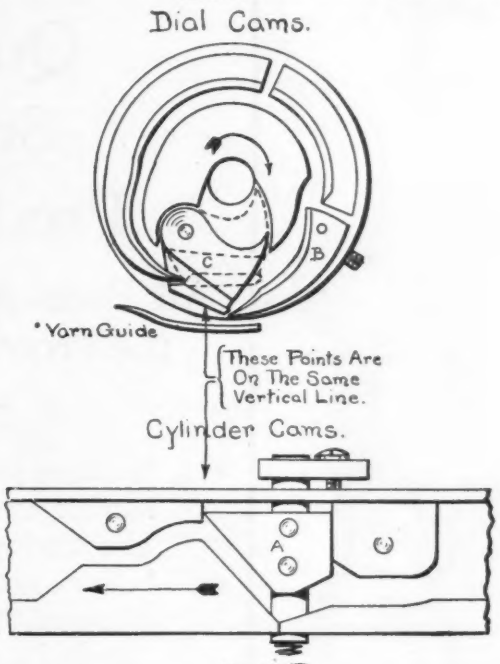


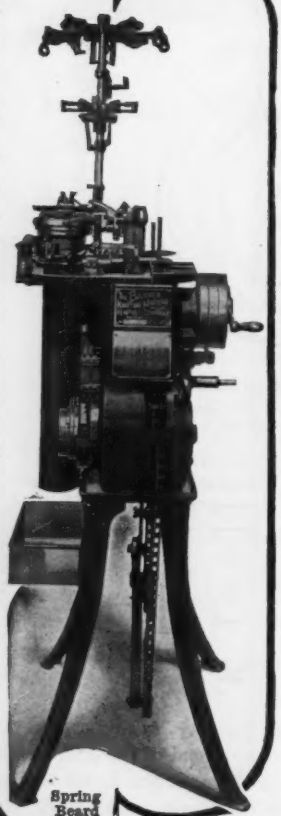
FIG. 1.

by the full lines it causes the dial needles to move so far out that the old loop drops over the end of the latch and is knitted off. When in the position shown in the dotted lines, the dial needles are not forced out much and do not get new yarn nor knit off the old loop. They simply "mark time," holding a loop while the cylinder needles knit alone. When the welt cam is in the central position, the dial needles are forced out far enough to get new yarn but do not go far enough to drop the old loop over the end of the latch. This means that when the needles draw in they hold two loops or a tuck stitch.

The cylinder and dial cams are controlled from a pattern mechanism at the side of the machine. Figures 2, 3 and 4 show various views of this pattern mechanism. Figure 2 is a plan view showing the dial cap under which are the cams in the upper part of Figure 1, the cylinder cam ring which carries the cams down in the lower part of Figure 1 and the various arms and levers used in controlling the cams. In addition, this shows a plan of the

The Banner

Full Automatic Hosiery Machines



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All Parts Accessible from the Front of Machine

We have just placed on the Market two new models– The Spring Beard Needle, built in sizes of 3" to 3 3-4" diameter, and a new model –Split Foot Machine, built in sizes of 3 1-4" and 3 1-2" diameter.

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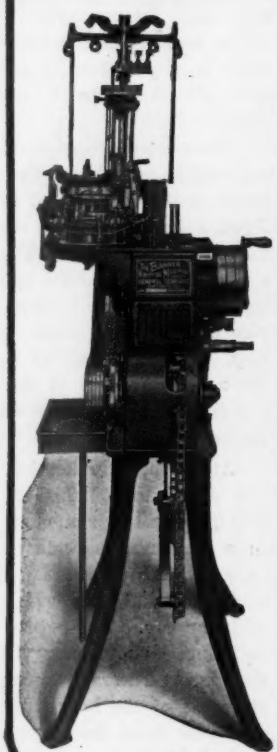

Split Foot Machine

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pattern mechanism and the welt disc which is the connection between the pattern mechanism and the cam control.

The control for the cylinder cams is as follows:

The welt disc, Figure 2, strikes a projecting arm (N) and by driving it inwards forces a second arm (L) in. This arm, L, swings over the top of the post P, carrying the stitch cam and forces it down. This action forces the cylinder needles further down and consequently, produces a loose stitch. After one course the welt disc changes its position and strikes a third arm, M, which draws the arm, L, back to its first position. The cylinder stitch cam is immediately forced back to the normal position by a spring.

The dial cams have a very different control. When the welt cam is clear out, the dial needles knit,—when the welt cam is half way out the dial needles tuck, and when the welt cam is clear in the dial needles are idle, that is, they take no new yarn and do not lose their old loop.

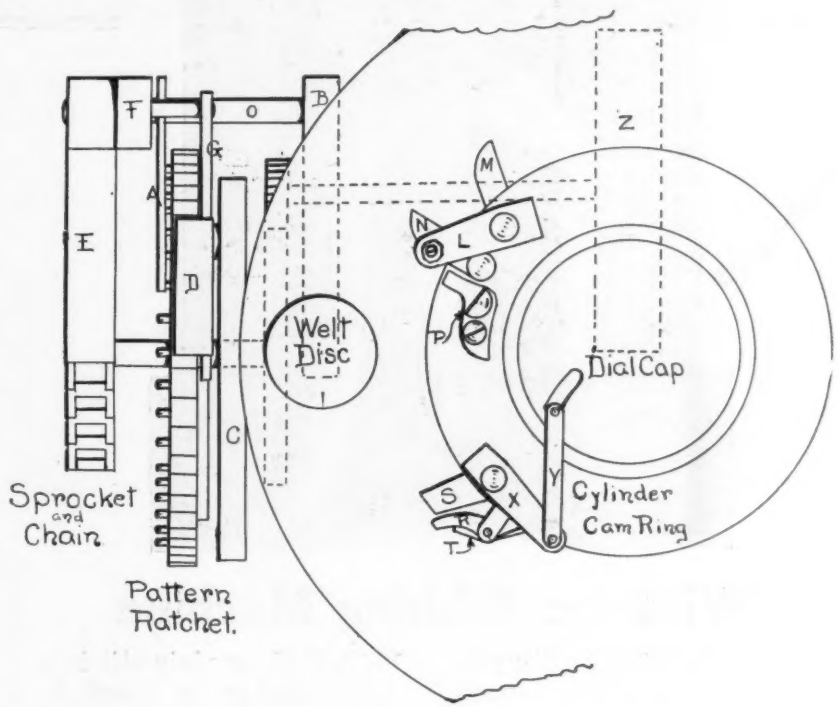


FIG. 2.

The control for the welt cam consists of a metal link Y, fastened to the upper end of an arm X, projecting from a vertical post. Near the lower end of this post is attached an arm S which projects to a position where it may strike the welt disc. Below this arm are two others R and T which may also strike the welt disc. On the inner ends of these two arms are small catches which hold projections from the vertical post and arm S. The catch on the lower arm T holds the post so that the welt cam is clear out, causing knitting. The catch on the upper arm R holds the post so that the welt cam is half way in, causing tucking. The arm S attached to the post is just above these two. It is used to reset the post in the grip of the low arm, after it has been released.

The normal condition is with the vertical post held by the catch of the lower cam T and causes knitting. When the welt disc strikes the lower arm T, the vertical post is released and by means of a spring is turned until caught by the upper catch R. In this position, the welt cam is half way in and the dial needles will tuck.

When the vertical post is released from the upper catch R by having the welt disc strike the arm R, it turns again until the welt cam is clear in and the dial needles are idle.

To reset the welt cam in the knitting position, the welt disc strikes the arm S fastened to the vertical post and turns it in the opposite direction to that turned when releasing from the catches.

The welt disc is then the controlling factor and its position controls the action of the dial welt cam and the cylinder stitch cam.

The following tabulation shows the positions of the welt disc and the resulting action:

		Dial	*Cylinder*
Bottom	1	..... .Tuck	Knitting
	2	.....Idle	Knitting
	3	.....Knitting	Knitting
Top	4	.....Knitting	Loose Course

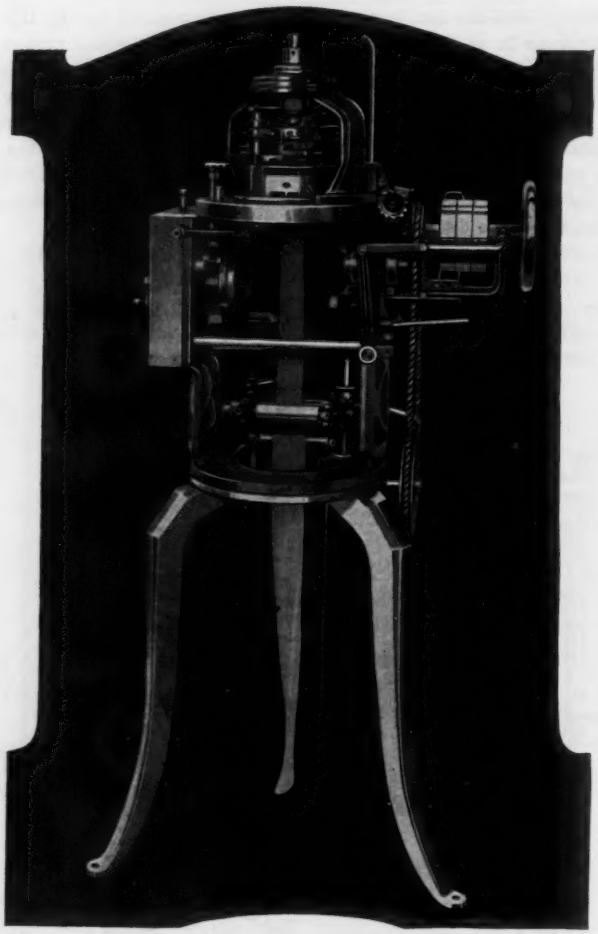
The welt disc is controlled by the pattern mechanism illustrated in Figure 3.

The pattern ratchet is a ratchet wheel having three concentric lines of holes, tapped to fit some specially made machine screws, often called pins.

The levers A and B are each fast to and fulcrumed at the shaft O. A is designed to rest upon the machine screws or pins which project from the pattern wheel. Consequently, the positions of both A and B are controlled by the position of the pin upon which A rests.

The welt disc rests upon the end of lever B and so is lifted and lowered by B. In this way the four positions spoken of previously are obtained.

There are three lines of pins in the pattern wheel and this gives three positions, the fourth is obtained when



Wildman Ribbing Machine

Wildman Circular Ribbers offer you the marked advantage of a two-speed drive.

The Wildman new style two-speed drive will operate at one speed for difficult stitches and at a speed two-thirds higher for plain knitting. As an illustration, a Wildman Ribber can be run at a speed of 100 revolutions per minute on welts and increased to 166 R.P.M. on plain stitches.

The change in speed is accomplished by the Wildman belt shifter mechanism, a decided improvement over a clutch.

On request we will send the "Wildman Ribber Catalogue" giving detailed illustrations and descriptions of every important part of the machine.

We have issued a very complete and informative book, "The Science of Knitting"—Price $3.00

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there is a pin in none of the three positions. So, we can change the table previously given to:

Pattern Ratchet	*Dial*	*Cylinder*
No Pin	Tuck	Knitting
Inside Row	Idle	Knitting
Center Row	Knitting	Knitting
Outside Row	Knitting	Loose Course

The periphery of the pattern ratchet consists of a series of ratchet teeth by means of which it is turned. The pawl D which engages with these teeth is carried on a horizontal bar C, located slightly above the pattern ratchet. This bar is connected with one end of a lever. The lever is fulcrumed at the other end. Between the two ends is a cam follower which runs in a cam raceway on the under side of the cylinder cam ring. This raceway

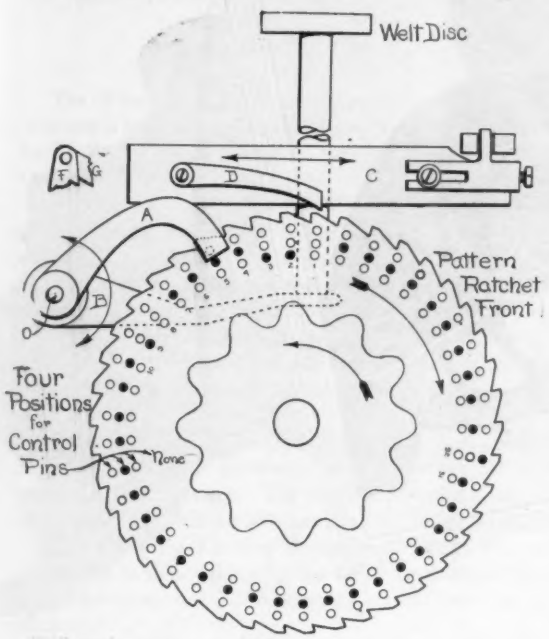

FIG. 3.

is eccentric and causes the lever to move forward and backward once for each turn of the cylinder. The parts are so designed that the movement of the pawl D, driven by them is just enough to move the pattern ratchet the distance of one tooth for each revolution of the cylinder and dial cams.

Thus, a single feed machine makes one course for every revolution of the cylinder and the pattern ratchet moves ahead one tooth. There are as many pin holes in each circle on the pattern ratchet as there are teeth, so that for each position of the ratchet there is possible a separate pattern control. This means that it is possible to make a change in the pattern at any or every course if desired. As a matter of practice, the changes on these single machines are not apt to be very frequent.

As the pattern ratchet moves ahead one tooth for each course, the maximum number of courses in a complete pattern would seem to be limited to the number of teeth in the pattern ratchet. In order to increase the number of courses possible in one pattern, a multiplying device is applied. This is only a device for keeping the ratchet driving pawl D out of action for a desired number of courses.

The device used for keeping the ratchet from moving consists of a system of levers and one or more pins on the reverse side or inside of the ratchet. These pins are the same as, and are turned into the same holes as the pattern controlling pins, but are on the opposite side from them.

In Figure 4, G is the lever used to keep the pawl D from moving the ratchet. Arms E and F are cast together and turn about the fulcrum O in such a way that when the arm E is lifted the arm F moves to the left, drawing the lever G with it. This motion draws the end of lever G from the pin and lets it drop so that the pawl can again come in action with the ratchet.

The mechanism for controlling the lifting of arm E is a chain carried by a sprocket concentric with the pattern ratchet. The sprocket is driven by gears connecting with a wheel covered with coarse card clothing. This wheel Z, Fig. 2, is in contact with the cloth and is driven by the cloth passing by it. In this way, the chain sprocket is turned very slowly and the ordinary links pass under the end of arm E. A special link H made with a pro-

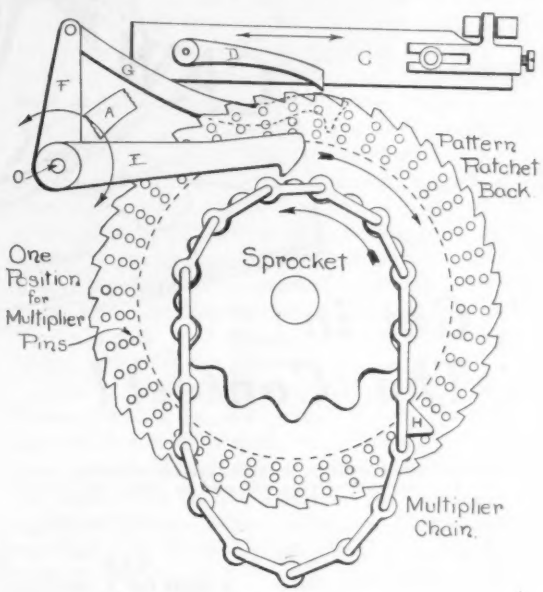

FIG. 4.

jection is used to lift arm E.

The action of the mechanism in making a half cuff may be as follows:

The pawl D forces the ratchet along one tooth for each course making the following action:

Courses	*Action*	*Arrangement*
1	Dial tuck	No pin
2	Dial idle	Pin inside row
3	Dial idle	Pin inside row
4	Both knit	Pin middle row
5	Both knit	Pin middle row
6	Both knit	Pin middle row
7	Both knit	Pin middle row
8	Dial tuck	No pin
9	Dial idle	Pin inside row
10	Both knit	Pin middle row
11	Both knit	Pin middle row

If you are not receiving "The Needle" regularly send your name and address today. It's free!

Get in The Contest!

We will give five dollars if the anonymous friend who sent us the following contributions will send us name and address—we will pay him Five Dollars.

"A crow lit on a hickory limb,
With a needle in his claw;
And the only thing he was heard to say,
Was Caw, CAw, CAW!"

CAW
A BIRD OF A NEEDLE
CAW

And this gives us an idea: Send us a rhyme about CAW Brand Needles,—10 lines or less,—and for the best one received each month during 1924 we will pay $5 and print it on the inside back cover of THE NEEDLE. All contributions must be mailed to us, and we will submit them to Major Frank Knox, Publisher of the Manchester Union Leader, who will be the sole judge of the winning contribution. The contest is open to all executives and employees of Knitting Mills. Send more than one contribution if you wish, but be sure to mention the name of the mill besides giving your home address. As that eminent French scholar, Mister Pete Sawyer, would say:

Send in your *Bon Mots*
And we'll pay the Five Spots.

Chauncey A. Williams,

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KNITTING NEEDLES

About here the multiplying pin comes under the lever G and stops the ratchet. Then for each inch of fabric desired two plain links are built into the chain. There should then be a "riser link" or one with a projection. As the cloth is knitted and passes by the card clothing covered wheel Z, it turns the sprocket and the chain passes the end of E. When the riser comes under E it lifts it and starts the ratchet moving again.

The ratchet then moves to about the thirty-first tooth with all needles knitting. Then the thirty-second tooth will cause a loose course by having a pin in the outside row and the rest of the forty-two courses will have all the needles knitting.

The first few courses make two welts, the main section will be the body of the cuff, followed by the loose course. The last few courses are the transferring courses or waste.

Among the Knitting Mills.

The Wilson Hosiery Company, of Pennsylvania, plans to locate a branch plant at Salisbury, N. C., it is announced by L. S. Moody, secretary of the Salisbury Chamber of Commerce.

Real Silk Hosiery Mills, Indianapolis, Ind., have awarded contract for the erection of their two-story and basement addition, 50 x 190 feet. Lockwood, Greene & Company, Chicago, are the architects and engineers.

Champion Knitting Mills, Chattanooga, Tenn., will erect a new building for its plant, which will be two stories in height, 50 x 179 feet, of modern brick construction. The capacity of the plant will be increased to 750 dozen pairs of hosiery a day.

Catawba Knitting Company, Rock Hill, S. C., recently installed additional machinery for the manufacture of ladies' fine silk hosiery. The augmented output, day and night operation, will be 200 dozen pairs of hosiery daily.

The Berkshire Knitting Company, Reading, Pa., have just added to their equipment the following electrical scrubbing apparatus: one No. 5 mopping machine and one substation.

Officials of the Armada Knitting Mill, Hamburg, Pa., have chartered a new company under the name of the Armada Knitting Mills, Inc., with capital of $50,000, to take over and succeed to the present plant and business. Tentative plans are under consideration for expansion. Elton A. Fraunfelter has been elected treasurer.

The Chicago Knitting Mills, Inc., Room 1205, 14 East Jackson Boulevard, Chicago, Ill., recently organized with a capital of $200,000, will operate a local knitting mill. The company is headed by Edward Carnes, Albert J. Kemper and Edward Blumenthal.

The Acorn Hosiery Mills, Frackville, Pa., have leased a site for the erection of a new knitting mill and are said to be arranging for the early preparation of plans. The cost is reported in excess of $30,000. S. D. Bausher is president.

The Famous Knitting Mills, Inc., 1182 Flatbush Avenue, Brooklyn, N. Y., has filed notice of a reduction in company capitalization from $140,000 to $75,000.

The Springtex Hosiery Co., New York, N. Y., recently organized with a capital of $10,000, will operate a local knitting mill. The company is headed by W. L. Brody and B. F. Lerch. It is represented by David Paris, 365 Broadway, New York.

The Wedgewood Knitting Mills, Ltd., Toronto, Ontario, recently formed with a capital of $100,000, has authorized plans for the erection of a new local mill, estimated to cost in excess of $50,000, including equipment. The company purposes to specialize in hosiery producttion.

The Beaver Brook Knitting Co., Inc., Waltham, Mass., has been chartered under state laws with a capital of $50,000, to take over and succeed to the local company of the same name. It is said that preliminary plans are under consideration for plant expansion. William Ludlam will be succeeded as president by F. G. Gauthier, heretofore treasurer of the organization.

The Hirlef Knitting Mills, Inc., Brooklyn, N. Y., recently organized with a capital of $25,000, will operate a local plant. The company is headed by I. Schwartz and S. Hirsch. It is represented by Drechsler, Orenstein & Leff, 225 Fifth Avenue, New York.

The Golden West Knitting Mills, Inc., 3208 West Roosevelt Road, Chicago, Ill., has been formed with a capital of $15,000, and plans for the operation of a local mill. The company is headed by Elix Marks.

The Friends Novelty Knitting Mills, New York, N. Y., formed under state laws, has arranged for the operation of a plant at 1685 Washington Avenue, and proposes to advance production at an early date.

The Horn Products Corporation, 435 East 102nd Street, New York, N. Y., and the Fayette Knitting Mills, Brooklyn, N. Y., affiliated interests, have filed a notice of dissolution for both companies under state laws.

The Eltex Fabrics Corporation, New York, N. Y., has been organized under state laws with a capital of $50,000 and 500 shares of common stock, no par value, to manufacture a line of knit goods. It is proposed to operate a local mill, for which arrangements will be perfected at an early date. The incorporators of the company are F. C. Taylor and H. W. Paprock. It is represented by F. J. Knorr, Albany, N. Y., attorney.

The C. B. S. Knitting Co., Front and Washington Streets, Reading, Pa., has arranged for the operation of a new branch mill at Leesport, Pa., where a building recently was leased, and will develop maximum output, with full working force in the near future.

The Wyoming Hosiery Mills, Co., Philadelphia, Pa., organized with Harold Lichter, 243 West School Lane, as treasurer and representative, will operate a local knitting mill.

The Snow Bird Knitting Co., Milwaukee, Wis., recently organized under state laws, will take over and succeed to the business of the S. Pasch Knitting Co., East Water Street. Tentative plans are being considered for increased capacity. J. Feinstein, head of the new company, has purchased the interest of S. Pasch in the former Pasch company.

The Union Knitting Mills, Inc., Newark, N. J., organized under state laws with a capital of $100,000, will operate a local plant. The company is headed by Charles H. Graessle and associates, and is represented by Edward Schoen, 24 Branford Place, Newark.

The Charmette Knitted Fabrics Corporation, New York, N. Y., lately formed with a capital of 250 shares of stock, no par value, will operate a local mill for the manufacture of a line of knit goods. The company is headed by C. B. Drucker and M. Klein. It is represented by Rosenblum & Sommer, 2 West Forty-fifth Street, New York.

New Attachments

Since its introduction, the Standard H Knitter has been recognized as having the most efficient and scientific construction of any hosiery machine on the market.

To the basic machine which is mechanically sound have been added improvements and important attachments for the production of specialties.

These lend added significance to the advantages of the Standard Knitter. For description of the new devices and information concerning those in process of development, write the consolidated concern.

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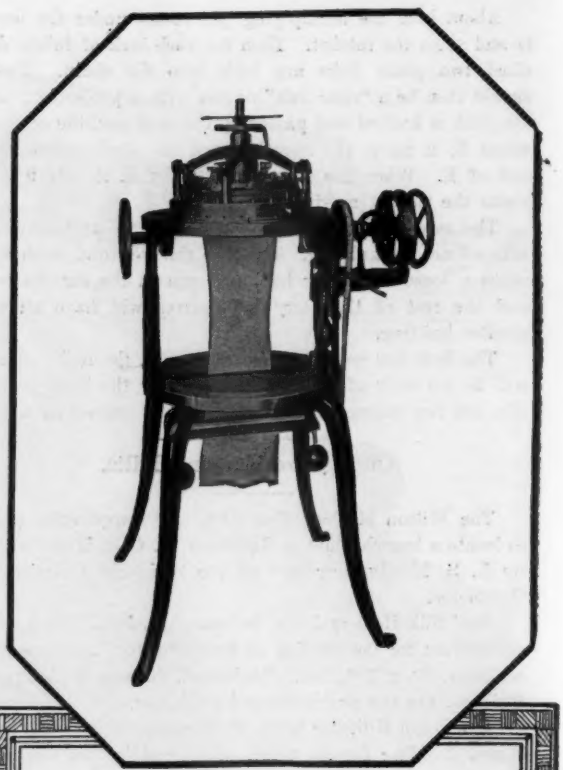

BRINTON BODY MACHINES

Plain or Automatic

Built in all sizes up to 24 inches. In all cuts up to 14 needles per inch.

You owe it to yourself to investigate this machine.

We also build all styles of Hosiery Ribbers and Knitters and various other circular machines for all kinds of knitted articles.

Samples, prices and patticulars on request.

H. BRINTON COMPANY

Philadelphia Pennsylvania

Knitted Washcloths.

EDITOR COTTON:

I should be glad to receive, through "Knitting Kinks," some information with regard to a knitted fabric used for wash cloths, which is finished on one side like Turkish toweling. Can any of your readers advise us where this material may be purchased, also what kind of machines are used in the manufacture of it, and where such machines may be obtained? R. T. Y. (Conn.)

To Take Care of the Curl in Hose.

EDITOR COTTON:

This is in reply to the question of "E. C. (Ill.)," with reference to the difficulty he is having with a curl in ladies' hosiery when hemming.

I suggest that he purchase the commercial device known as a welt folder. With this welt folder he will be able to eliminate the trouble of curling and also to get more uniform lengths of the hem or welt.

This device is fastened to the edges of the seaming table to the right of the operator, and is adjustable to any desired width or length; by adjusting the two upright pieces in or out, one can take care of the width of the hose, and by adjusting the two lower guide arms the length can be taken care of. To take the curl out of the stocking it is better to set the two upright pieces, which have the steps cut in them, a little wider than the width of the hose, and the lower ones will give the same. In some cases, where an exceptionally long hem or welt is desired, it will be necessary to turn the two lower guide arms downward if the proper length cannot be obtained on the main rod. With this device, also, the operator will be able to increase production. J. F. D. (Pa.)

A Set of Mill Rules.

EDITOR COTTON:

In our mill we have successfully used the following working hours, and have installed the following rules with splendid results. I pass them along for what they may be worth to the other readers of "Knitting Kinks," and to suggest that it would be of interest to have some of them send in to you their rules for publication.

Our working hours are from 7:30 A. M. until 12 noon, and from 12:45 until 5:15 P. M. Saturdays from 7:30 until 12 noon. These, we feel, are reasonable hours, and we therefore look to the employees to be in on time, lateness is a bad practice and will not be tolerated.

Among our rules are the following:

Employees are requested not to stay out without permission, as this is a direct cause for contention, which we wish to avoid.

Employees unable to report on account of sickness or unforeseen happenings are asked to let us know by postal or by phone.

We positively insist on all employees doing good work. All work not done to our satisfaction will be returned to the operator for correction, and she or he will be responsible.

We do not want to send out inferior work as this loses business, which means a loss to the company as well as to the employee, so be careful.

All employees must put their names on the tickets with each lot and style of work. Failure to do this will cause the operator to be responsible.

All work spoiled caused by a broken needle or any other cause must be returned to the forelady. Spoiled work is not to be hidden or carried out.

Each employee is responsible for the cleanliness of his or her machines and respective places, which we suggest be cleaned each night.

Employees are asked to report at once all poor materials and shortages in lots, etc. This is very important.

Be sure to count your pay, as no mistakes will be rectified after employees leave the mill.

Our slogan: Safety First.

A clean mill indicates efficiency, ability and success; a dirty mill shows poor management, inefficiency and failure.

By making certain that all employees understand the foregoing rules thoroughly, we find that a great deal of contention, misunderstanding and lack of understanding between ourselves as employers, and our people as employees, is prevented. Old Knitter (Pa.)

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Figuring Underwear Manufacturing Costs.

EDITOR COTTON:

I believe that the inquiry of "M. R. T. (Tenn.)," who asks for the approximate labor cost in the manufacture of men's 13 and 16-pound garments, the approximate cost of trimmings, and the approximate cost of packing, can best be answered by the accompanying forms together with the following explanation:

Many cost finding systems, through fallacy, have attempted to follow the cost of a bale of cotton or a case of yarn directly through to the finished garment, but this is not practical because it is rarely possible to trace material in regular production from start to finish. Therefore, to an underwear manufacturer who spins his yarn, there are three distinct manufacturing problems, and he must determine the cost of each, namely, the finished yarn, the finished cloth and the finished underwear.

Date Figured 4/16/24 — CLOTH COST — Cloth Style ECRU 233 HEAVYWEIGHT #11 KARDED PEELER

FOR STYLES 233

	Per Cent. of Mixture	Price	Weight	Material	Productive Labor	% Exp.	Expense	Total
Yarn (Material)		.42¢	103#	43 26				43 26
Winding Labor PER 100#		.60¢	103#		62	120%	74	136
Knitting Labor PER		$1.00	100#		100	250%	250	350
Dyeing and Dry Labor 100#		$1.25	100#		125	300%	375	500
Chem. Cost Material		$1.50	100#	150				150
Napping Labor PER 100#		.50¢	100#		50	200%	100	150
TOTAL				44 76	337		799	56 12

Total Cost $56.12 — Total Knit Wt. 100# — Cost per Lb. .56¢

Fig. 1

Date Figured 4/18/24 — CUFF CLOTH COST — Cloth Style 18 CUFF (ECRU) No. 20 COMBED PEELER

FOR STYLES 122 AND 233

	Per Cent. of Mixture	Price	Weight	Material	Productive Labor	% Exp.	Expense	Total
Yarn (Material)		.60¢	103#	61 80				61 80
Winding Labor PER 100#		.95¢	103#		98	120%	118	216
Knitting Labor		$3.25	100#		325	250%	813	1138
Dyeing and Dry Labor PER		$1.25	100#		125	300%	375	500
Chem. Cost Material 100#		$1.50	100#	150				150
Napping Labor NONE								
TOTAL				63 30	548		1306	8184

Total Cost $81.84 — Total Knit Wt. 100# — Cost per Lb. .82¢

Fig. 2

Date Figured 4/18/24 — CLOTH COST — Cloth Style 122 ECRU MEDIUM WEIGHT NO 18 SINGLE KARDED

FOR STYLES 122

	Per Cent. of Mixture	Price	Weight	Material	Productive Labor	% Exp.	Expense	Total
Yarn (Material)		.45½¢	103#	46 87				46 87
Winding Labor PER 100#		90¢	103#		93	120%	1 12	2 05
Knitting Labor PER		$1.80	100#		1 80	250%	4 50	6 30
Dyeing and Dry Labor 100#		$ 1.25	100#		1 25	300%	3 75	5 00
Chem. Cost Material		$ 1.50	100#	1 50				1 50
Napping Labor NONE								
TOTAL				48 37	3 98		9 37	61 72

Total Cost $61.72 — Total Knit Wt. 100# — Cost per Lb. .62¢

Fig. 3

In this particular instance we shall pass up the yarn spinning costs and begin our cost with the purchased yarn, arriving first at the cost of the finished cloth as shown on Cloth Cost Sheets 1, 2 and 3, respectively. This particular yarn was purchased on the net weight of yarn basis and repeated tests show a total shrinkage of 3 per cent during the winding and knitting operations. Therefore, to arrive at approximately 100 pounds of knitted cloth, we must then cover for these operations shrinkages by starting with 103 pounds of yarn which is multiplied by the price per pound.

The first operation is that of winding the yarn from cones to bottle bobbins preparatory to the knitting of the cloth. This is piece work labor and is paid for at the rate of 60 cents per 100 pounds. Therefore, 103 pounds multiplied by 60 cents equals 62 cents for piece work labor, see Fig. 1. All expense within a department is based upon the productive labor wage paid in that department, and in winding the total expense being made up of foreman share, general non-productive labor, oil, machine repairs, miscellaneous supplies, heat, light, power, fixed charge share is equal to 120 per cent of the productive labor wage for the same period. Therefore, we multiply the productive labor figure, 62 cents, by the 120 per cent expense, and arrive at the expense 74 cents, and then adding the 62 cents and the 74 cents we have a total of $1.36 expense for winding.

In like manner we determine the labor and expense cost of the several succeeding operations, namely: Knitting, Dyeing, Drying and Napping, adding in the materials used in the dyeing operations. We finally arrive at the material, productive labor, and expense totals, and these added give us the total cost of $56.12 for 100 pounds of knitted cloth or 56 cents per pound. (Please understand that this batch of dyed cloth does not weigh 100 pounds for it has shrunk about five per cent through the dyeing

TOTAL PIECE WORK $1.45

MEN'S UNION LONG SLEEVE — C. C. REGULAR

Style ANKLE LEG — Size ALL

CUT, FOLD & SEW ON HANGERS .04

CUT & BUNDLE (24) CUFFS .02½

Operators Name

Folding	.10½	FOLDING M Reg. CC
Pressing	.06¼	PRESSING M Reg. CC
Inspecting	.17	INSPECTING M Reg. CC
But. Sew	.05	BUT. SEW M Reg. CC
But. Mark	.02	BUT. MARK M Reg. CC
But. Hole	.08½	BUT. HOLE M Reg. CC
Patching	.06¼	PATCHING M Reg. CC
Seam Leg.	.08	SEAM LEG M Reg. CC
Tack Front	.03	TACK FRONT M Reg. CC
Cro. Front	.03¾	CRO. FRONT M Reg. CC
Fell Flap	.02⅝	FELL FLAP M Reg. CC
Seam Coll.	.06½	SEAM COLL. M Reg. CC
But. Facing	.03¾	BUT. FACING M Reg. CC
But. Stay	.03¾	BUT. STAY M Reg. CC
Trimming	.04⅛	TRIMMING M Reg. CC
Seaming	.24	SEAMING M Reg. CC
Cro. Flap	.03⅛	CRO. FLAP M Reg. CC
Seam Cuff 4	.08	SEAM CUFF 4 M Reg. CC
Cutting	.12	CUTTING M Reg. CC

Fig. 4

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BANKERS TRUST BLDG.
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VOLUNTEER BUILDING
CHATTANOOGA, TENN.

ADAMS-FRANKLIN BUILDING
CHICAGO

WESTAWAY BUILDING
HAMILTON, CANADA

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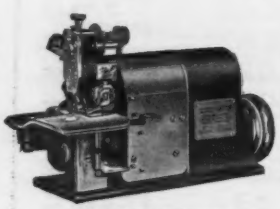
CHESTER, PA.

MERROWING



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IT MEANS: MAXIMUM PRODUCTION
MINIMUM EXPENSE
UNEXCELLED QUALITY OF WORK

THE MERROW MACHINE COMPANY
ESTABLISHED 1838
16 LAUREL ST., HARTFORD, CONN., U. S. A.

Garment MENS UNIONSUIT

GARMENT
LABOR SPECIFICATION SHEET

Date 4/18/24

ALL SIZES FOR STYLES LONG SLEEVES – LONG LEGS

	PRODUCTIVE LABOR	TOTAL DEPT. LABOR	% EXPENSE	EXPENSE	TOTAL LABOR AND EXP.	DESCRIPTION	ITEM
CUTTING DEPT.—PIECE	12						
DAY	02						
TOTALS		14	140%	20	34		
SEAM & FINISH DEPT.—PIECE	129						
FINISH DAY	12						
TOTALS		141	90%	127	268		
HANGER & REBOX—PIECE	04						
DAY	09						
TOTALS		13	50%	07	20		
TOTAL		168		154	322		

Fig. 5

and drying operations. I, however, call it 100 pounds of knitted cloth because it is on this basis of weight, cloth right off the knitting machine, that we use in determining the cloth cost. The dyeing shrinkage is taken care of properly at the start of the Finished Garment Cost Card.

Operation tag marked No. 4 shows all the operations pertaining to the finishing of a man's union suit in sequence of operation and also shown are the approximate piece work rates paid for each individual operation. (These operations should be 100 per cent piece work labor and rates properly set.) The total piece work as shown is $1.45 for the entire finishing of one dozen union suits.

Garment Labor Specification Sheet marked No. 5 shows the piece work labor in the cutting, finishing and re-box departments as taken off the operation tag and day work labor in these departments as taken off the distributed pay roll. (Experience over long periods.) You will note that after the cloth cost has been ascertained, we get labor and expense cost on the dozen garments from cutting to the boxing. The productive labor, both piece and day work, total $1.68 and expense figured on the productive labor is $1.54.

Finished Garment Cost Card marked No. 6 is figured on a 16-pound ecru dyed cotton men's union suit with long sleeves and long legs. The 16 pounds apply to size 42, whereas over years of experience we find the average size to be size 40, consequently our cost is based on size 40, which, when finished, weighs about 15¼ pounds to the dozen.

Returning to the Cloth Cost Sheet No. 1, we learn that this cloth costs 56 cents per pound, and tests over many years tell us that because of the average shrinkage in the dyeing and drying operation and in the waste made—necessary and unnecessary—in the cutting department, we must use for our weight 16½ pounds knitted cloth on a size 40 suit. (On size 42 there is required 17½ pounds of knitted cloth to cut one dozen suits.) We must in addition also figure the cuff cloth as shown on Cuff Cloth Sheet marked No. 2.

The total finishing supplies were made from actual tests and include thread, buttons, sateen, patches and hanger.

Paper boxes and labels, one of the items, are the actual costs of six boxes, gummed end labels, tissue paper linings, band around garments and tying tape or string.

"Total Packing Cases, Etc." include packing case, case lining paper and nails, or cartons and glue or string divided by dozens of garments the case or carton may hold.

"Waste" shows the credit given the materials for the money received from the sales of waste received from cutting and seaming of garments, sold weekly.

The items "Total Productive Labor" ($1.68) and "Total Mill Expense" ($1.54) are taken off the Garment Labor Specification Sheet marked No. 5. The total of material, labor and expense is $14.97 and this is called the Total Manufacturing Cost. At this cost only all garments shipped should be charged out of goods in process into cost of goods sold, the other expenses following. Total Manufacturing Costs are not a part of it, they are simply further deductions from the profits, for profits cannot be actually figured until after the merchandise has been shipped and invoiced.

The loss on seconds is arrived at after years of records very accurately kept. It shows that three per cent of our entire production is turned into seconds and these seconds are sold at a discount of 33⅓ per cent from the gross selling price.

"Administrative Expense" is taken at three per cent of the selling price. This may not be considered equitable by many who take the stand that it costs no more administrative to sell garments at $75.00 per dozen than it does

Artificial Silk Yarns

All grades and Deniers
American and foreign
products

Largest distributor of Artificial Silk Yarns in the U. S. A.

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GRANITE STATE LATCH NEEDLES have won their enviable position by consistently making knitting machines run more smoothly with fewer interruptions. They do their work perfectly, never fraying the yarn, because they are made with painstaking care and exactness with no rough latches or rivets, everyone uniform, tempered for maximum resiliency and strength, and finished to a satin smoothness. The large number of satisfied users is ample indication of the confidence the knitting industry has in Granite State Latch Needles.

Ask for samples.

GRANITE STATE NEEDLE CO. LACONIA, NEW HAMPSHIRE

16 POUND MENS UNION SUIT, ENTIRELY FLAT LOCKED
LONG SLEEVES ANKLE LEGS.
FINISHED GARMENT COST
GARMENT STYLE 233 SIZE 40
DATE FIGURED 4/18/24 YARN COST 42¢

DESCRIPTION	Long Sleeves / Long Legs Weight Unit	Amount
Regular Cloth 56¢ Per Lb.	16½#	9 24
Cuff Cloth 84¢ Per Lb.	¾	63
Total Cloth Cost		9 88
Total Finishing Supplies		1 34
Total Paper Boxes and Labels		48
Total Packing Cases Etc		14
Total Materials		11 84
Credit Waste		09
Total Material Cost		11 75
Total Productive Labor		1 68
Total Mill Expense		1 54
Total Manufacturing Cost		14 97
Loss on Seconds 3% - 33⅓% Less		18
Administrative Expense 3%		54
Selling Expense 9%		1 62
Discounts Given 2%		36
Total Cost Goods Sold		17 67
Gross Selling Price		18 00
Profit ~~or Loss~~		33
Per Cent Profit ~~or Loss~~		2%

Fig. 6

13 POUND MENS UNION SUIT, ENTIRELY FLATLOCKED
LONG SLEEVES - ANKLE LEGS -
FINISHED GARMENT COST
GARMENT STYLE 122 SIZE 40
DATE FIGURED 4/13/24 YARN COST 45¢

DESCRIPTION	Weight Unit	Amount	Weight Unit	Amount	Weight Unit	Amount	Weight Unit	Amount	Weight Unit	Amount
Regular Cloth 62¢ Per Lb.	13¼#	8 21								
Cuff Cloth 82¢ Per Lb.	¾	62								
Total Cloth Cost		8 83								
Total Finishing Supplies		1 30								
Total Paper Boxes and Labels		44								
Total Packing Cases Etc.		12								
Total Materials		10 69								
Credit Waste		07								
Total Material Cost		10 62								
Total Productive Labor		1 68								
Total Mill Expense		1 54								
Total Manufacturing Cost		13 84								
Loss on Seconds 3% - 33⅓% Less		17								
Administrative Expense 3%		50								
Selling Expense 9%		1 48								
Discounts Given 2%		33								
Total Cost Goods Sold		16 32								
Gross Selling Price		16 50								
Profit ~~or Loss~~		18								
Per Cent Profit ~~or Loss~~		1%								

Fig. 7

to sell garments at $18.00 per dozen, and thereby burdening the higher price garment simply because it will stand it. They are right to a certain degree, but believe me, the time spent by our executives in planning and explaining and raising particular he—ll, as Ring Lardner says, with our salesmen, endeavoring to teach them to sell our higher priced numbers leads me to feel that the low priced numbers or leaders are the styles that are burdened with administrative, for possibly these leaders should carry none whatever; they sell themselves.

The selling expense is figured upon the selling price; it includes sales manager, sales offices, salesmen's commissions, advertising, etc.

"Discounts" possibly needs explanation. This percentage represents principally the deductions made by customers from their bills which they call discount and to which they are not justly entitled. It would be nice indeed if they added interest instead—but "them days is gone forever."

S. H. E. (Mass.)

The Advantage of Carrying a Stock of Extra Parts.

EDITOR COTTON:

I know of some knitting mill managers who think it a good policy to have the fixers or foreman repair broken parts, such as castings, brackets, and putting teeth in gears and making springs, using a different gauge wire than the broken one because they did not have the proper wire on hand, etc.

This practice, I find, is not an economical one, when you take into consideration the time the machine is stopped and the time it takes the fixer or foreman to repair the part, the loss of production it will cause will amount to more than the cost of a new part if it were on hand or in stock. For instance, a part is broken and the cost of a new one is fifty cents. The fixer, because there is no new part on hand, will repair the broken one, and it takes him one hour or more, and the machine is stopped during that time resulting in the loss of that much production.

If you will add the rate per hour of the fixer and the loss of production, etc., it will amount to a great deal more than the price of a new part in many cases. It pays to carry a stock of parts on hand, as very often it more than returns the investment of money which seemed unnecessarily tied up with parts in stock.

I have been in mills that had a fully equipped machine shop and a first-class machinist, where the manager does not approve of repairing parts or having the fixer or foreman repair them. These mills, I find, carry a stock of the different parts, such as stitch cams, elevating cams, lifting pickers and pull down pickers, the different springs and screws, etc., so that the fixer can get them when needed and by having this stock on hand in many cases a machine is stopped only for a few minutes, while if the fixer had to repair the broken part the machine might have stood an hour or more.

It is much better to have a fixer sit down and look at the machine running than to be continually fixing at them. For instance, I was once in a mill in New England and heard the superintendent tell the fixer, "I'd rather see you wearing out the seat of your trousers than to be fixing at the machines all the time and being 'busy,' because when you are sitting around we are getting off the production,

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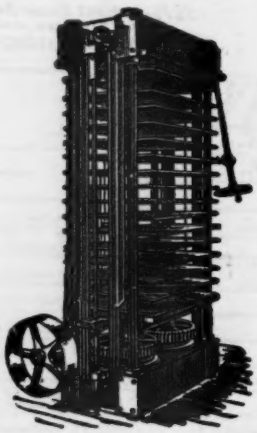

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Hosiery and Underwear
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GENERAL MACHINE WORKS
YORK, PA.
Manufacturers of
Circular Rib Knitting Machinery
Cylinders and Dials

but when you are continually fixing the machines we are losing production." Old Knitter (Pa.)

Finding the Yarn Cost per Pound.

EDITOR COTTON:

In answer to "M. V. F. (Ga.)," I trust you will pardon me for the direct using of any names, but this inquirer would be much benefited by the reading of S. R. Gordon's article, "Determining Yarn Costs," which had its beginning on page 387 of February, 1924, number of COTTON. I am myself clipping these pages and making them up in book form. Mr. Gordon's fine experience in cotton mills is being written in a practical way, and we are fortunate to be able to read it through COTTON'S columns.

Many cotton spinning mills determine the labor and overhead costs in a general way over all manufacturing and then by adding or deducting an estimated amount for each number of yarn, they in this fashion arrive at what they term manufacturing cost on a given number. This is plainly guess work and guess work never had a place in finding costs. The minute it is done, a fact becomes a fallacy and an unsound selling policy is the ultimate result.

The "Unit" method of determining the manufacturing cost of yarn per pound by size or number allows for the setting of units in direct relation to the pounds production of each number of yarn taken off per spindle in a given time. As an example, we will say, for instance, the pounds production of each number of yarn taken off 100 spindles in one hour of actual running time. This is the only practical basis for equitable manufacturing cost finding figures and it is a very simple and understandable method.

We, of course, know that the manufacturing costs of 100 pounds of unfinished cotton yarn (regardless of the numbers which eventually will be spun) is so much and the same as the cotton is opened, picked, mixed, lapped, carded, drawn and slubbed. So far the cost of this unfinished yarn is strictly on a per pound basis, no differentiating having taken place (for granting that the cotton is of required quality it may be used either for No. 6 or No. 60 yarn, and of course we must consider this article as not applying to combed yarns).

However, beginning with the speeder operations we have a different story and the manufacturing cost of different numbers per pound of unfinished yarn in the roving will depend entirely upon the size of the hank and the number of the times the roving is speeded to produce the desired yarn number.

Not being acquainted with the conditions and practices of "M. V. F.," I cannot accurately set up in the speeder unit table the hank rovings which he would find are necessary in order to spin the different numbers of yarn in his mill, but I am sure from the detailed table which I give he will be able to apply his own figures and arrive at a result which he will find to be satisfactory.

By way of explanation, the $30,000 as given as Total Manufacturing Cost is made up of Productive and Non-Productive Labor with all expense items and supplies added making a combination of direct labor and overhead. The pay roll should be so distributed as to give the productive and non-productive labor totals at the end of a month or period for the several departments of the mill. Also the expense column in the charge or voucher register and the expense requisitions should be in shape to be analyzed and the different departments so charged with the expense belonging to them; also each department should be charged with its shares of heat, light and power, rent or fixed

SPEEDER UNIT TABLE.

Yarn Number	Hank Roving	Total Minutes required to Produce 100 Pounds	Relative Unit	Total Pounds Produced	Total Units Produced	Total Speeder Manufacturing Cost	Speeder Manufacturing Cost per Unit	Speeder Manufacturing Cost of 1 Pound Hank Roving
4								
5								
6	1¼	67	1.00	45,000	45,000			.0078263
7								
8								
9	1¾	80	1.19	45,000	53,550			.0093132
10								
11								
12								
13	2½	97	1.45	60,000	87,000			.0113481
14								
15								
16								
17	3½	179	2.67	60,000	160,200			.0208961
18								
19								
20								
21	4½	300	4.48	60,000	268,800			.0350616
22								
23	4¾	340	5.07	30,000	152,100			.0396791
			TOTALS....	300,000	766,650	$6,000.00	.0078263	

SPINNING UNIT TABLE.

Estimated by Tests, Pounds Production of Carded Yarn Taken Off 100 Spindles in 60 Minutes of Actual Running Time.
(No stoppage allowance.)

Yarn Number	Total Pounds Production 100 Spindles in 60 Minutes	Time required to Produce 24¾ Pounds per 100 Spindles	Relative Unit	Total Pounds of Yarn Produced	Total Units of Spinning Produced	Total Spinning Manufacturing Cost	Spinning Manufacturing Cost per Unit	Spinning Manufacturing Cost by Number of Yarn per Yound
4	24.75	60	1.00	15,000	15,000			.0100769
5	19.60	76	1.27	15,000	19,050			.0127977
6	16.10	92	1.53	15,000	22,950			.0154177
7	13.65	109	1.82	15,000	27,300			.0183400
8	11.70	127	2.12	15,000	31,800			.0213630
9	10.30	144	2.40	15,000	36,000			.0241846
10	9.20	161	2.68	15,000	40,200			.0270061
11	8.25	180	3.00	15,000	45,000			.0302307
12	7.45	199	3.32	15,000	49,800			.0334553
13	6.80	218	3.63	15,000	54,450			.0365791
14	6.20	239	3.98	15,000	59,700			.0401061
15	5.75	258	4.30	15,000	64,500			.0433307
16	5.30	280	4.67	15,000	70,050			.0470591
17	4.90	303	5.05	15,000	75,750			.0508883
18	4.55	326	5.43	15,000	81,450			.0547176
19	4.25	349	5.82	15,000	87,300			.0586476
20	4.00	371	6.18	15,000	92,700			.0622752
21	3.75	397	6.62	15,000	99,300			.0667091
22	3.50	424	7.07	15,000	106,050			.0712437
23	3.30	450	7.50	15,000	112,500			.0755768
			TOTALS....	300,000	1,190,850	$12,000.00	.0100769	

charges distributed on an equitable basis.

As no figures were given for the correct distribution of the $30,000, we have made the following divisions. In the opening, picking, mixing, lapping, carding, drawing and slubbing departments we have consumed $12,000 as a total manufacturing cost in these above mentioned departments is divided by the total pounds production. It is straight cost per pound basis.

In the speeder department we have consumed $6,000, which, if taken on the average cost per pound of roving, would be 2 cents, but it is necessary that the Unit method be applied to production in this department.

In the spinning department we have consumed $12,000, which, if taken on the average cost per pound of yarn, would be 4 cents, but it is also necessary that the Unit method be applied to production in the department.

Explaining the Speeder Unit Table. I have estimated number 4-5-6 yarn to be spun from 1¼-hank roving and the time to produce 100 pounds of roving at 67 minutes, and in like fashion determined the minutes to produce the several other rovings required for the finer yarns. Using the 67 minutes as the unit of 100, we arrive at a set of units in direct relation to the unit of 1.00 by dividing each of the total minutes required to produce 100 pounds by the 67 minutes. If we multiply the total pounds of each roving produced by its relative unit, we determine the total units of each roving produced. By adding the total units of each roving produced we arrive at the grand total units of roving produced. If we divide the Total Speeder Manufacturing Cost by the grand total units produced, we determine the Speeder Manufacturing Cost per unit and then by multiplying the Speeder Manufacturing Cost per unit by its respective unit, we determine the Speeder Manufacturing Cost of 1 pound of Hank Roving 1¼-1¾-2½-3½-4½-4¾ respectively.

Explaining the Spinning Unit Table. I have estimated

DETAILED SHEET SHOWING TOTAL MANUFACTURING COST PER POUND OF SPUN YARN BY INDIVIDUAL YARN NUMBER.

Yarn No.	Straight Pound Cost through all Depts. up to but not includ-Speeders	Cost through Speeders	Cost through Spinning	Total Mfg. Cost per Lb.
		Cents	Cents	Cents
4	.04 Cts.	.0078263	.0100769	.0579032
5	.04 Cts.	.0078263	.0127977	.0606240
6	.04 Cts.	.0078263	.0154177	.0632440
7	.04 Cts.	.0093132	.0183400	.0676532
8	.04 Cts.	.0093132	.0213630	.0706762
9	.04 Cts.	.0093132	.0241846	.0734978
10	.04 Cts.	.0113481	.0270061	.0783542
11	.04 Cts.	.0113481	.0302307	.0815788
12	.04 Cts.	.0113481	.0334553	.0848034
13	.04 Cts.	.0113481	.0365791	.0879272
14	.04 Cts	.0208961	.0401061	.1010022
15	.04 Cts.	.0208961	.0433307	.1042268
16	.04 Cts.	.0208961	.0470591	.1079552
17	.04 Cts.	.0208961	.0508883	.1117844
18	.04 Cts.	.0350616	.0547176	.1297792
19	.04 Cts.	.0350616	.0586476	.1337092
20	.04 Cts.	.0350616	.0622752	.1373368
21	.04 Cts.	.0350616	.0667091	.1417707
22	.04 Cts.	.0396791	.0712437	.1509228
23	.04 Cts.	.0396791	.0755768	.1552559

(To test the accuracy of the Unit method and to prove this sheet. Note the last column shows the Total Manufacturing cost per pound for each number of yarn, therefore, the total of this column represents the cost of 20 pounds of yarn, and if the total is multiplied by 15,000 pounds (which there is of each number of yarn) the result will be $30,000, which is the amount represented as the Total Manufacturing Cost of 300,000 pounds of spun yarn.)

by tests on 4s yarn the pounds production off 100 spindles in 60 minutes of actual operating time at 24¾ pounds and in like fashion determined the pounds of other numbers of yarn inclusive to number 23, produced from 100 spindles each actually running 60 minutes. Using the 60 minutes as the unit of 1.00, we arrive at a set of units in direct relation to the unit of 1.00 by dividing each of the minutes—time required to produce 24¾ pounds of yarn per 100 spindles—by the 60 minutes. If we multiply the total pounds of yarn produced by its relative unit, we determine the total units of each spinning produced. By adding the total units of each spinning produced, we arrive at the grand total units of spinning produced. If we divide the Total Spinning Manufacturing Cost by the grand total units produced, we determine the Spinning Manufacturing Cost per unit by its respective unit, we determine the Spinning Manufacturing Cost of 1 pound of yarn from number 4s to 23s inclusive.

S. H. E. (Mass.)

Seek Ways to Prevent Underwear Shrinkage.

An investigation of the causes of underwear shrinkage and the search for means of preventing excess shrinkage formed the subject of a conference which met at the Bureau of Standards recently. The conference was attended by representatives of the underwear manufacturers, the laundrymen's associations, the washing machine manufacturers, wholesalers, retailers, hosiery manufacturers, The Mellon Institute, the Bureau of Standards, and other representatives.

Among the factors which are to be considered in the research program are the effect of twist on shrinkage, the effect of the number of courses per inch, the effect of tension in knitting, and the relation of dimensions of garments to size. All of these investigations are to be conducted by the manufacturers, through their research fellows now stationed at the Bureau, it was agreed.

According to the decision of the conference, the Bureau of Standards, with the aid of the laundry owners and soap manufacturers, is to investigate the effect of laundering processes on shrinkage. This will include a study of types of machine, temperature of washing solution and of drying, kinds of soap, amount of soap, the effect of wringing, pressing, and finishing both in the factory and in the laundry, and the effect of hardness of water.

Different types of fabric, it was pointed out, require different treatment in the laundry, and in the case of fabrics whose nature can not be readily identified by inspection, as mixed wool and cotton, artificial silk, etc., it would be desirable to have some marking permanently on the garment, that would tell the laundryman what it was and how to treat it. This problem will be considered by laundrymen and underwear manufacturers. Washing directions are often given, it was stated, but are put on a paper label which is removed before the garment is sent to the laundry. Some more permanent marking was suggested, such as a number which by agreement is to stand for a definite composition.

Shrinkage in underwear is found to occur irregularly. A laundry, it is stated, may get, within a period of a few months, a large number of complaints of shrinkage of some particular brand of underwear, and then these will cease. The next batch of complaints may concern a different brand.

Education of laundrymen and especially of housekeepers with regard to the precautions needed is considered an important part of the program. This is to be carried out with the cooperation of housekeepers magazines and trade publications, it is stated.

COTTON is full of ideas that it has taken managers and superintendents years of study, hard knocks and experience to find out. You can acquire them in a few minutes. What an opportunity! Are you taking advantage of them?

The Yarn Market

In these days, this monthly report of conditions in the Philadelphia cotton yarn market is getting to be pretty much the same thing each month, only more so. In no major line of textile business was there any especial reason for jubilees on the part of sellers, and the yarn market occupied a prominent section of the mourner's bench.

In addition to the perennial May flowers, the fifth month of the year, even upon the threshhold of approach, brought the lowest price level of the year for white yarns, while tinged materials saw lower than since the waning days of last summer. Carded yarns as a group steadied during the first week in May, however, and held this more healthy position well up into the month, but combed yarns weakened during the second week. The apparently stronger position occupied, however, failed to exert any stimulating influence upon the market.

The estimated amount of curtailment in combed yarn plants was around fifty per cent, but this had little influence on things in the way of assisting prices. Furthermore it was the opinion that in spite of curtailment procedure the spinners were in a position that was continually growing weaker, and that many were in urgent need of business.

Pressure for business and lack of demand were the dominating factors in the dullness of the market. The first resulted from desire on the part of spinners to dispose of some of their yarns, and the absence of interest on the part of buyers continued over from the past several months, being reflected back from stagnant markets for their own respective products. It was said that even were yarns a dime lower than the existing low scale, that feature of it probably would not attract yarn consumers until their customers began to show signs of life. The margin or gap between the attitude of consumers and the position of the spinners appeared to be widening on what transactions were consummated. Until buyers further along the line indicate a material interest, and until a more general realization comes of actual conditions in reference to the raw staple and the size of the crop is more accurately determined, factors expect continued dullness with possible further recession in rates.

When the time comes, however, experienced factors anticipate a period of better conditions. The present situation is reflecting back to the mills in a most unsatisfactory manner, and a climax seems to be approaching. Whether conditions will become too serious before the turn in buying interest comes, remains to be seen.

As the situation stands at present, it was pointed out, the production costs vary considerably between the different yarn mills, and there is a fluctuation and a variation in rates on the market. It was explained that the mills with the low costs are "making" the fundamental markets, together with those mills who are willing to operate their plants at a loss in order to provide employment for their operatives.

Quotations on the Philadelphia market on May 16 follow:

Single Skeins.

4s to 8s	41½	10s	42½
12s	43	14s	43½
16s	44	20s	45
24s	47	26s	48
30s	50		

Single Warps.

8s	42½	10s	43
12s	43½	14s	44
16s	44½	20s	45
26s	49	30s	51
40s	58		

Carpet and Upholstery Yarn in Skeins.

8s and 9s 3-4 slack	42½
8s and 9s 3-4 tinged tubes	36½
8 3-4 hard white warp-twist	39
8 3-4 hard twist waste	35½

Two-Ply Skeins.

8s	42½	10s	43
12s	43½	14s	44
16s	44½	20s	45
24s	47	26s	48
30s	50	40s	57

Two-Ply Warps.

8s	43½	10s	44
12s	44½	14s	45
16s	45½	20s	46
24s	48	26s	49
30s	51	40s	58½

Frame Spun Carded Yarn on Cones.

8s	41½	10s	42
12s	42½	14s	43
16s	43½	18s	44
20s	44½	22s	45
24s	45½	26s	46
30s	48	40s	57
30s double carded			49
30s tying-in			47

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	60	20s	61
24s	63	30s	65
40s	70	50s	75
60s	80	70s	93
80s	1.02		

Mule Spun Carded Yarn on Cones.

10s	45	12s	46
14s	47	16s	47½
18s	48	20s	49
24s	51	26s	52
30s	55	40s	62

Mule Spun Combed Peeler Yarn on Cones.

10s	52	12s	53
14s	54	16s	55
18s	56	20s	57
22s	58	26s	62
28s	63	30s	64
36s	67	38s	70
40s	72		

Greenville to Be at All-Southern Show.

Fred L. Bryant, Chairman of Chamber of Commerce Committee in charge of the Greenville Section of the Southern Exposition to be held in The Grand Central Palace February 2 to 14, 1925, announces that Greenville firms have applied for approximately 1,500 square feet of space. The business interests of Greenville have realized that the prominence of an All Southern Show held in New York will attract sufficient attention to give nation-wide advertising and have determined to make Greenville's display a conspicuous one.

All products will be strictly Greenville made. The great variety of cloths made by the local mills will be shown. These will include heavy duck, medium weight goods, fancy mixed silk and cotton dress goods and all-woolen worsteds. Spaces have been taken by the dyeing, bleaching and finishing plants and several textile accessory manufacturers will display their products. Many other firms and organizations with national reputation will be represented.

The entire Greenville Section will be under the supervision of the Chamber of Commerce who will show the many advantages offered to new industries. Plans are well advanced to make the annual Acquaintance Tour to New York during the show.

It is also of interest that approximately 60 per cent of the South Carolina space has been applied for.

LEESONA
REG. U. S. PAT. OFF.

Mr. Cloth Manufacturer

WE ask you to give careful consideration to the several advantages of using Universal Wound Filling Yarn in your looms. The economical manufacturing process of rewinding spun filling was introduced only after a long period of experiments and perfecting had overcome every objection to its use, and established it as a paying investment for you.

Cloth mills, producing almost every type of fabric, have found this preparatory process of undisputed value, and willingly admit that the use of filling yarn, prepared for weaving by Universal Winding, has exceeded the greatest expectations.

We ask you to consider its use in your mill, and we stand ready to submit the proof of its advantages, both in the production of more and better cloth and in the reduction of production cost.

Will you favor us with your inquiry?

UNIVERSAL WINDING COMPANY.

UNIVERSAL WINDING

The DIFFERENCE!

Between good needles and needles that are almost good enough there is but little difference - often so slight that special gauges are necessary to measure it.

The least variation from an established standard, places a needle in the "almost good enough" class. In this factory, these needles are scrapped.

"Excelsior - Torrington" labels go on first quality needles only.

The TORRINGTON COMPANY
TORRINGTON CONN. U.S.A.

C. B. BARKER & CO., LTD.
140-144 W. 22nd STREET
NEW YORK

LOS FABRICANTES UNIDOS
964 CALLE BELGRANO
BUENOS AIRES

MANUFACTURERS SUPPLIES CO.
CHERRY AND JUNIPER STS.
PHILADELPHIA

The Knit Goods Market

Developments in the general commodities markets, more especially in textiles in the last month, were of a character to hold in check trading in cotton knit goods, regardless of the condition of stocks among jobbers and retailers. Since it appears that staples are to be had from stock, there is, of course, a disposition on the part of distributors to hold commitments down to bare needs, a policy that is even more pronounced than at the beginning of the year. There apparently is little decline in consumption. The public is buying about as usual, except where there is suspicion exorbitant profits are being taken. It is not doubted in the trade that if retailers were to revise their prices as manufacturers have theirs, there would be little complaint from the public.

Mills are carrying the burden and operating on dangerously low margins. Retailers by buying as needed, escape the burden and extracting wartime margins on an almost normal turnover, and have little to reckon with other than the weather, which often since the dawn of spring has turned shopping days into a forlorn hope.

Continued high prices certainly have encouraged economy in buying for personal needs, and it may be said that it is not so easy as it once was to maintain a weekly average of sales. The business that, under favorable conditions would have been done at the counter and was not seldom is compensated for in whole in a succeeding week, this being true especially of hosiery that is worn for show rather than for service.

Strength in the raw cotton market served during the long period of suspended buying in the goods markets to fairly maintain prices of cotton hosiery and underwear, and it may be noteworthy that not in a number of weeks have there been momentous fluctuations in low end cotton hosiery. Prices have been comparatively stable, sellers willing to shade, however, for quantity contracts. There has been a narrowing of the gap between asking prices and prices offered, and the variance as between high and low for stockings in the 144 and 176 needle class amounts to around 2½ cents a dozen. Quotations on silk hosiery, except when accompanied by somewhat accurate descriptions, are practically meaningless, because of the difference in construction and weights.

It is viewed as favoring mills that production, considerably curtailed, is not being increased; that it is being more nearly balanced with demand. There still are ample stocks from which jobbers may draw for spot shipment, however, notwithstanding mills are running an estimated average of 35 hours a week. The outlook is that this is, or soon will be, better than for the varied textile industries in Philadelphia. Since the public mid-May auction of rugs by the Alexander Smith & Sons Carpet Company established prices from 16 to 18 per cent lower than last year it is common report that manufacturers will either reduce wages 10 per cent or close mills, which for some time have been running on reduced worktime schedules. It was the general belief employees would accept the reduction rather than be left idle, if it be the understanding that with revival of business existing schedules be restored. So the situation in the rug mills probably will be no worse and may become better. Any improvement in any quarter necessarily will be helpful to the drooping hosiery primary market, but the good effect will be felt in silk rather than cotton lines.

Whether we like it or not, cotton hosiery is losing out in competition with silk. Women's plain stockings selling around 25 to 50 cents a pair are among the weaker numbers in hosiery. Ribbed and dropstitch goods are pressing hard on the plain, but also suffer from offerings of stockings of silk and combination at spectacularly low prices such as came out last month during special sales conducted by several of the larger department stores. What were described as first quality full fashioned silk, sold regularly at $1.75 to $2 a pair, were sold at $1.28, customers getting a further advantage in the purchase of three pairs for $3.65. Branded goods from a half dozen well known mills selling to retailers direct were on sale to the extent of 30,000 pairs in three Philadelphia stores. These dealers evidently had gathered in much hosiery in the hands of manufacturers overloaded.

It is not improbable that much defective hosiery masquerading as perfect is passing over the counters of stores featuring price. Manufacturers complain of unevenness in silk, one result of which is streaky hosiery. In dark colors, black in particular, it is stated, the streaks, usually appearing at the point of greatest tension, are barely perceptible to the untrained eye except when the stocking is on the leg or stretched over a form. In the light shades they are more easily detected in the handling of the stocking.

In a mill where very rigid inspection is maintained it is stated that while there are but two per cent of seconds due to defective workmanship, they may run as high as eight per cent when the silk runs unevenly. It was the custom to allow for five per cent of seconds, whereas now the allowance is ten per cent. Some of the seconds are the result of redyeing. A manufacturer in Philadelphia has, for the time, discontinued making sheer hosiery because of the character of silk usually supplied. Throwsters say the trouble can be ascribed to less rigid inspection of the raw silk and the fact that at the tail end of the crop year, with the better descriptions having been taken, there is little better than remnants from which to draw supplies. One hosiery mill is reported paying two dollars a pound more than the market for best No. 1 extra, in order to produce the best stocking possible and minimize the number of seconds and rejects.

There is no little speculation as to whether black is returning as a popular silk hosiery color. A leading mill which a few months ago was making practically none now reports black about five per cent of the total output. For several weeks white has been leading in this mill's sales, and what is true here probably is typical of the situation in most mills making the higher classes of goods. While black appears to be promising as a fall and winter color, none is being bought for distant deliveries, and as the bright shades —many of them—have become so commonplace as to be regarded likely to wane, these too are being bought very conservatively. Style uncertainty, to say nothing of hesitancy to place forward orders, is, as it for some time has been, retarding business in hosiery.

Confidential reports obtained from a half dozen or more

representative manufacturers of varied lines all show that forward business in hosiery is in lower volume than in a long time. There has been a very large increase in the numbers of orders and shipments, yet a falling off in the sum total of a months' business. A mill operating three days a week will have four times as many shipments as when last year it was being run at capacity. The increased cost of doing business in this fashion is absorbed at the mill; retailer and jobber bear none of it, nor will they while manufacturers feel they must depend on forced selling.

So determined are some jobbers to carry no stock that they will defer buying until depletion forces them into the market, and they then will buy for spot, express shipment, and pay five to ten cents a dozen more in transportation charges than if they had contracted in time to have the goods go forward by freight. As they must keep within the retailer price range they cannot pass the increased cost along, and usually shop around until they find a mill willing to make a concession sufficient to take care in part, at least, of this added cost as a penalty for trying to do business on stocks in mills. On a saving of five cents a dozen there may be an increase of ten in shipping charges.

Primary market trading undeniably was affected by a slowing down among retailers last month due to adverse weather conditions. Collections had been unsatisfactory even before the chill of May, continuing until after the middle of the month, in some sections, and left the impression they would not improve materially in June. With sales showing a temporary decline, retailers were more disposed than ever to make no commitments for future. Another side of the situation was the hesitancy of wholesalers to extend credit, and the rejection of many orders from dealers whose credit rating for the time was in question. So that there were buyers to whom goods were denied, while there were sellers who could not coax orders from establishments whose responsibility was not under scrutiny.

One of the surprises last month was the failure of silk hosiery to maintain the brisk pace of the previous month. Instead of continued activity there was less, and some of the hitherto busy northern mills were left with few orders, and not many coming through pending an adjustment in which human agencies could not figure—that of temperatures. Some of the larger mills were as seriously affected as smaller concerns. On the other hand, a manufacturer here and there was well supplied with orders and running full. This was true more particularly of several mills in interior Pennsylvania. The Kraemer Hosiery Co., Nazareth, Pa., with 29 full fashioned machines, was reported having placed an order for 21, to be installed soon. The company had but eight machines a few years ago. The Oakbrook Hosiery Mills of I. C. Eberly, Reading, which several months ago increased the full fashioned equipment, is reported operating at capacity, with no slowing down in prospect.

The general situation in Reading is less satisfactory than in April. Some mills are being operated until noon five days a week, some are idle and it is understood others will be before the end of June unless the situation improves. Very few are running all their machinery full time. It probably would be a conservative estimate to say that the average for all is less than four days a week.

Philadelphia mills making distinctive lines that have not been overproduced are comfortably situated. Several on misses' fancy top ribs are running 18 to 24 hours a day, and some manufacturers of infants' socks have not found it necessary to reduce their worktime schedules. In silk lines, seamless and full fashioned, the situation as a whole is far from being as satisfactory, while the few mills making coarse gauge cotton hosiery are having less work than in a long time. Not so long ago it was the mills selling to retailers that were having a decided advantage over those distributing through jobbers. Last month it appeared that both classes were about equally affected, and it looked as though it might be necessary to carry curtailment further for escaping the evil of an overstocked market.

Women's fiber hosiery, in which there had been exceptionally good business, comparatively, suffered a setback with tram silk. Fiber boot goods of standard construction were commanding three dollars a dozen. Recent sales at $2.90 are reported. Early in May a southern mill was unable to promise deliveries before the middle of June, and several orders were lost to it for this reason. Fiber goods with plain cotton tops had been sold down to $2.50 a dozen, and that was thought to represent the bottom, but later a price of $2.40, for export, was heard. Prices of tram combination with artificial silk also sagged. Raw silk was easy and showing signs of further drooping, and artificial silk was available in abundance at the low prices established in February.

Fiber hose with plain cotton top, toe and heel, made from thread under A grade was quoted down to $2 a dozen, and a still lower grade at $1.85, while $2.45 was obtained for socks made from 150 denier A grade artificial silk. Half hose of fiber and tram in twist continues a fairly good seller, price depending on the proportion of the two fibers, and socks of artificial silk plated on mercerized yarn are easily a favorite, at prices satisfactory to retailers.

A strictly good silk half hose finds a fair market at $5 a dozen. Colors are the vogue, and French tan is said to be one of the more attractive shades. The line of a Pennsylvania mill maintaining high standards has proved a good seller, going over the retail counter at 75 cents a pair. This is 25 cents under the lowest price full fashioned silk sock, and it appears that the latter at a dollar is not a hard competitor. Dropstitch socks in mixture for men seem to have been helped by weather conditions. More nearly ideal temperatures will start a buying movement of seamless silk. Demand for the more expensive silk half hose is lighter than for several years, according to reports from a few mills making lines costing retailers $24 a dozen and up. The silk sock brigade seems intent on reducing the "high cost of living."

A new low price for mercerized hosiery was recorded last month in a sale of a considerable lot of women's 220 needle single sole goods at less than $2 a dozen. Exporters had been offering $2.90, and the lot sold probably was taken for overseas shipment. A few weeks ago 10 cases were sold to an eastern jobber at $2, who at the same time paid $2.35 for 240 needle goods.

Women's mercerized hosiery seems unable to hold up against fiber boot hose selling at the counter at 50 cents. It ought to have been apparent months ago that there was excess production of mercerized, but the low prices heard seem to indicate there has been little let up in output. Some manufacturers say they believe it will come back; that at present prices production will be cut sharply, and that then demand will enable mills to sell at a profit. Others doubt that mercerized of 220 needles can be moved at more than

35 cents at the counter, with combed stockings available at 10 cents a pair less.

Plain combed goods of any description are dragging, however, to an extent indicating an all-round drifting from cotton hosiery not in the novelty class. Women's carded are perhaps a better proposition, from the standpoint of sales, than either combed or mercerized, it appearing there is little call for anything between the very low price in cotton and the lower priced in silk lines.

Combed and mercerized half hose are in free offering, at prices which can have no meaning other than that the market is not absorbing a fair proportion of production. Double sole 220 needle combed, which some months ago was being held for $1.85 a dozen, is easily obtainable at $1.60, with five cents more being quoted. Single sole 200 needle also are down around 15 cents from the season's peak, being quoted at $1.45, but available at a shading. The two numbers of combed have as their nearest competitors mercerized of single sole and cotton top, quotations on which also are susceptible of shading.

Aside from fancy top ribs and drop stitch goods for misses there appears to be no one class of hosiery in sufficient demand to warrant production at the present stage, except where it may be deemed feasible to make up stock in preparation for an upward turn in the market.

Misses' ribs and infants' socks should, under average conditions, come on the market in June for the next season. While an early showing of samples seems not probable, it is possible, in view of large duplicate business, indicating dealers have had better than usual sales, that a few mills will come out on the customary schedule with prices. It is realized that to get any volume of business on an early opening prices would have to be low; not higher, at any rate, than existing lists. In favor of a late opening is the dealer policy of buying nothing in advance of needs. Distributors probably will want to make a cleanup of this year's patterns before giving consideration to new ones.

It is the consensus that what the textile markets need more than early openings is early adjournment of Congress.

The cotton underwear market, which has gone from bad to worse, seems likely to experience some sort of a revival before the end of June. An executive of one of the more important mills in Tennessee sees in better inquiry from certain jobbers a deeper interest in the matter of getting supplies of heavy weights late in the season. Sub-standard goods bought early are believed to have been pretty well sold by jobbers, notwithstanding retailer aversion to placing orders before August and September, and as the fight is on price, it is regarded not unlikely southern mills shortly will be booking business for late deliveries.

That this view is held in the North is shown in an effort of New York State manufacturers to get production cost down to a minimum. A movement in this direction was started about the middle of May with the announcement of wage reductions in some of the Mohawk Valley mills. It was understood the operatives would prefer reductions to closing of mills, particularly with an understanding that when conditions warrant, the hitherto schedules be restored.

Jobbers have stood in practically solid phalanx against existing prices. They have been selling for summer in very restricted volume and reasoned that retailers would buy even more sparingly of goods for winter. They hoped against hope for recessions in the cotton market. A few weeks ago northern mills making cotton ribbed and bal briggan light underwear accepted slightly revised prices, and it was stated a few were selling at opening figures. The effect of this was to encourage among jobbers the hope of downward revisions on heavy weights, and May found them no nearer the market than in March and April. Now it is becoming a question of whether to buy or risk getting deliveries against contracts placed in July.

Several buyers have sought to obtain from mills a promise that goods would be available when wanted, no matter how late orders might be placed. There may be some manufacturers who so committed themselves, but it is known that some have declined flatly to operate on promises; that they will guarantee deliveries to only such establishments as put in firm orders, accompanied by details. A hosiery mill is offered enough business in misses' wool hose for next fall to keep the plant running three to four months, but buyers have not supplied details, so that the orders have no meaning other than as indicating a belief wool ribs will be wanted—some time. Underwear orders minus specifications would not materially help mills at present in need of business.

When the Cooper Underwear Company, Kenosha, Wis., selling direct to retailers, early in May announced lower prices on heavy weight union suits by from $1.50 to $2.50 a dozen, it was felt this might force mills selling to jobbers to go after orders on a downward revision. It had no such effect. Manufacturers foresaw in the attitude of retailers a disposition to ignore prices for goods which they will not require for some months, and concluded that jobbers would not be influenced by reductions unless they received some encouragement from the retail trade. So prices were kept where they had been put, and results probably are not different from what they would have been had the jobber mills followed the course of the Wisconsin manufacturer.

In the hope of bringing retailers to market the organized hosiery and underwear jobbers put on a three-days special sale in the third week in May. Nearby trade in four states was freely circularized. There was fair response, and it was not doubted a number of dealers would take advantage of concessions named for the occasion. But winter underwear was involved in only a sentimental way.

Some orders for September deliveries are reaching mills, but repeat orders are in much lighter volume than last year, when initial orders were larger. A New York State jobber bought two dozens of men's union suits to be delivered by parcel post. Such transactions are not uncommon. Jobbers are buying for little more than to maintain assortments. When these are broken through a sale to a stray retailer, another little order is sent to the mill. Manufacturers are doing practically a retail business even though selling to jobbers. Active buying may be expected to take a start so soon as retailers have a normal movement of summer goods. Mills have held for months to price. The longer wait is behind them. If production be kept down they doubtless will realize on the reduced turnover. It is conceded the year's output of underwear will be considerably below that of last year.

Isolated cases of retailers undertaking to do business on stocks that have not left the mill or jobber, and which may be said to be typical of the prevailing policy, come to the surface occasionally. One of the better known men's stores

was found with but one garment of a given size in a popular line of nainsook underwear. A customer wanted a half dozen, which is not an unusual purchase in stores of the character of that referred to. He got one, the store promising to send the remainder when a shipment arrived from a western jobber. It often happens that the jobber is as bare of stock as was this retailer. Such a condition in the trade is developing. It points to the conclusion that soon dealers will wake up to the extent they will at least be able to supply daily customers' needs.

The situation as to women's knitted underwear is perhaps more deplorable than that in any other knitting division. Fewer mills are operating in the Schuylkill Valley in Pennsylvania than a month ago. This is due in part to the causes for depression applying to many lines and in part also to the wider use of silk garments. But it transpires that two manufacturers of various lines of women's silk under garments are operating but three days a week. Thus it appears that silk and cotton are sharing alike in the effect of curtailed consumption or overproduction, whichever way one wants to state it.

A few Pennsylvania manufacturers of men's winter garments have received orders in the last month for deliveries running into August and September, and there are several instances of slight wage increases in small towns where the supply of help is restricted and there is a demand for farm help during the summer months.

An eastern manufacturer who canvassed a dozen or more engaged in similar lines says that, without exception, the replies received by him attribute the stagnation in staple cotton goods to lack of confidence, no explanation accompanying the replies, however, as to why there is absence of confidence.

Standardization of Hosiery Lengths Planned.

Standardization of the lengths of various grades and styles of hosiery is the next project which the National Association of Hosiery and Underwear Manufacturers will undertake, working in conjunction with the textile division of the Bureau of Standards, Department of Commerce, Washington, D. C., according to a statement by John Nash McCullaugh, national secretary and industrial manager, 334 Fourth Avenue, New York. An outline of the work to be done has been completed by the Bureau of Standards officials, and, according to them, it will follow the same general lines used in making a servey of hosiery sizes which resulted in the standardization of a method of measuring hosiery for size.

Mr. McCullaugh's decision to release information regarding the latest efforts of the association came as a result of a communication from E. M. Schenke, Research Fellow of the National Association, stationed at the Bureau of Standards, to the effect that the project was fairly well started and that requests to various manufacturers for samples of all grades of men's, women's and children's hosiery would be mailed shortly.

This project of standardizing the lengths of hosiery is in line with the association's plan of cooperation with the government to put the hosiery industry on a standard basis as is being done in other industries in the country. As is already known, the Bureau of Standards in cooperation with the hosiery association has perfected the system of measuring the size of hosiery in such a way that more uniform sizes may be produced by the industry as a whole. A further result of the work being done by these two bodies is the standardization of hosiery boxes and packing methods. The standard method of measuring hosiery for size has been accepted by the Federal Specification Boards for all government hosiery requirements and has also been approved by many organizations and manufacturers. Standardization of packing and boxes has also met with wide approval and already has more than paid for the effort and expense entailed by an actual financial saving to many manufacturers who have adopted the specifications.

These two systems of standardization are mentioned to emphasize the importance of the work being done along these lines by the association and the government. It is confidently expected that an effort to bring about some sort of definite hosiery lengths will meet with the same widespread approval and success as the other two projects, which were inspired by the fact that practically every manufacturer in the country has his own measurements and his own system of boxing and packing, different in many respects from those of every other manufacturer. Such a condition in the hosiery industry did not make for the best production; thus the standardization methods conceived and put into execution by the association and the Bureau of Standards. A similar condition exists in the matter of hosiery lengths and it is this condition of many and varied lengths which are to be rectified by the present project.

According to E. M. Schenke, who devotes his entire time to endless mechanical and chemical research work with hosiery, underwear, yarns and dyes in the knitting laboratories of the Bureau of Standards as the research fellow of the National association, the standardization of hosiery lengths is the next logical step toward the completion of the entire project, which includes the master specifications of hosiery now being investigated by the Government. The successful completion of the present plan, however, depends on the earnest cooperation of the manufacturers, Mr. Schenke declares, as the Bureau is dependent on them for working samples. Mr. Schenke feels sure that they will cooperate to the fullest extent as they have done in the past.

Actual work on the length project will be started at the Bureau as soon as the first consignment of hosiery is received, it is stated. It is hoped that the project will be completed in September and those immediately concerned in the operation of the Bureau are working with that time as their goal. To that end, Mr. Schenke has prepared a circular describing the grades and styles of hosiery necessary to the work, to be mailed to manufacturers with an appeal for their cooperation. Upon the rapidity with which manufacturers respond to the Government's request for working samples will depend the completion of the project within the time specified. It is also pointed out that the more complete the lines of hosiery sent to the Bureau by the manufacturers are the more quickly and perfectly will the project be finished as results are dependent upon a detailed survey of every type of hosiery made in the country.

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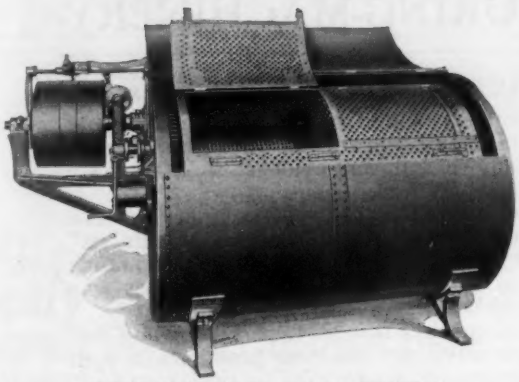

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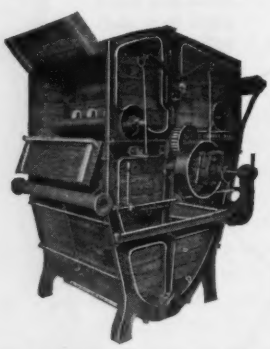

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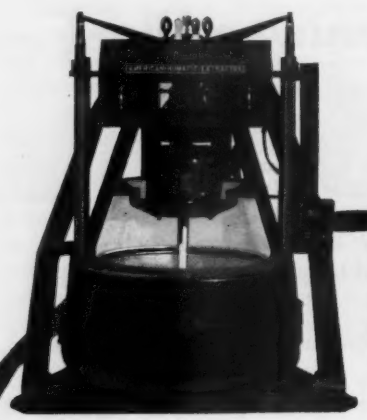

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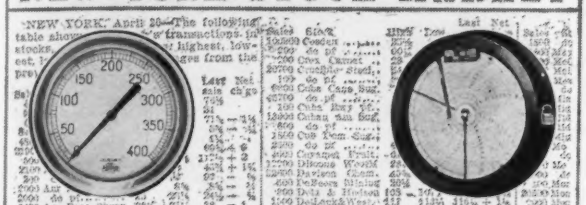

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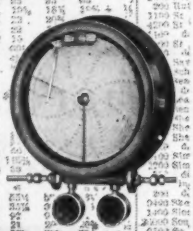

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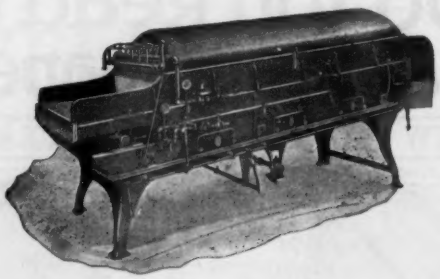

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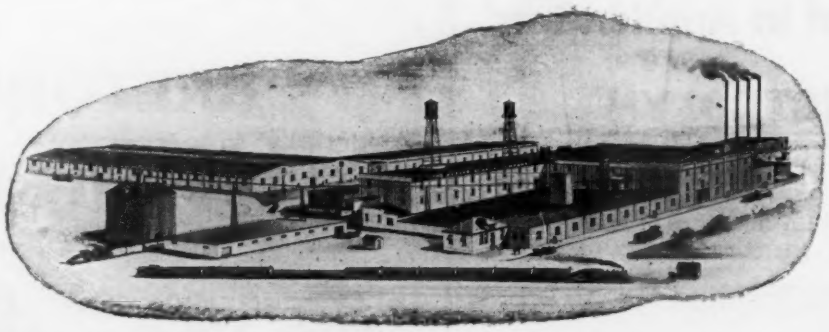

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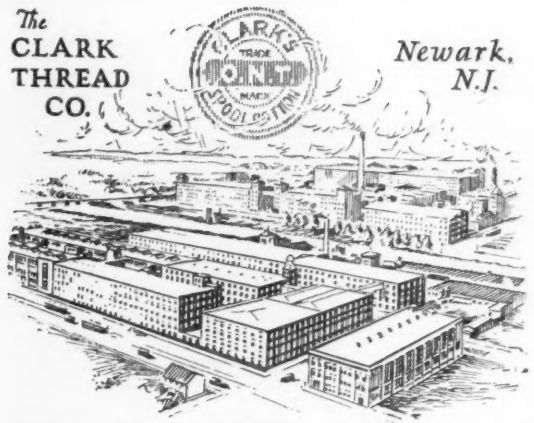

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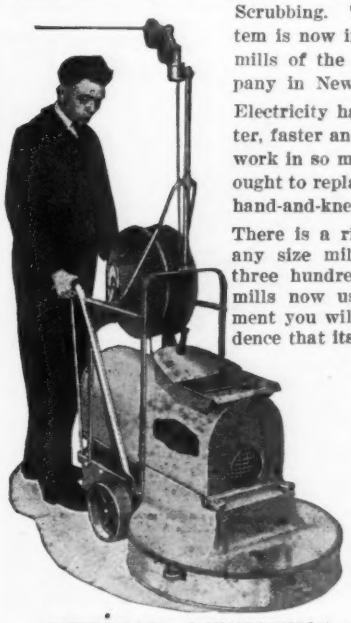


Electricity has proved itself better, faster and cheaper than hand work in so many ways—surely it ought to replace such drudgery as hand-and-knee scrubbing.

There is a right sized outfit for any size mill. And among the three hundred and more textile mills now using Finnell Equipment you will find plenty of evidence that its use will pay you.

FREE BOOKLET

"Electrical Scrubbing" will be mailed to any executive on request. Ask to see our motion picture demonstration. One of our Scrubbing Engineers will gladly show it. No obligation to you.

AMERICAN SCRUBBING EQUIPMENT SALES CO.

District Offices in Principal Cities

56 COLLIER ST. HANNIBAL, MO.

FINNELL SYSTEM

OF ELECTRIC SCRUBBING

"Clean Floors Reflect Clean Business"

Automatic Scales

For Weighing or Checking

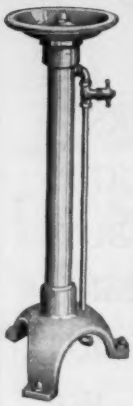
Raw Material	Tops	Yarn
Sorts	Laps	Yardage
Soap, Alkali and Dyes	Bobbins	Section Beams
Balls and Sliver	Roving	Shipments
Test Pieces		And for many other purposes

Toledo Scale Company, Toledo, Ohio

Canadian Toledo Scale Co., Limited, Windsor, Ontario
Largest Automatic Scale Manufacturers in the World
106 Sales Room and Service Stations in the United States and Canada. Others in thirty-four foreign countries

MURDOCK
WATER SERVICE

DRINKING FOUNTAINS FOR MILLS and PLAYGROUNDS



"SANDOW"
Self-closing Fountain
Nickeled, Bronze Bowl and Bubbler

Real water devices made for heavy duty service. FOOL-PROOF. Bubbler is adjustable to water pressure and affords a full soft bubble and a satisfying drink. A thin squirting stream is impossible.

Bubbler heads and stop cocks sold separately when wanted.

Outdoor Bubble Fonts for Playgrounds.
Yard Hydrants —Fire Hydrants

"HERCULES"
Cast Brass
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Write for fully illustrated catalogues.

The Murdock Mfg. & Supply Co.
Cincinnati, Ohio
Makers of Anti-Freezing Water Devices since 1853

SAVOGRAN

A National Verdict of "NOTHING BETTER" Merits Your Consideration

INDIA ALKALI WORKS
Boston, Mass.

Attractive **Sanitary**

MILLS METAL

Per manent **Economical**

- Toilet Partitions
- Dressing Rooms
- Shower Stalls
- Shelving
- Tables
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"Mills Metal" Products once installed prove a permanent investment to the purchaser. Their design makes them the most adaptable products on the market for textile mill use.

"Slant Lip Diamond Rail Top and Bottom"

Constructed entirely of the highest quality rust-resisting steel. Finished in Olive Green or Gray Baked Enamel.

Write for bulletins.

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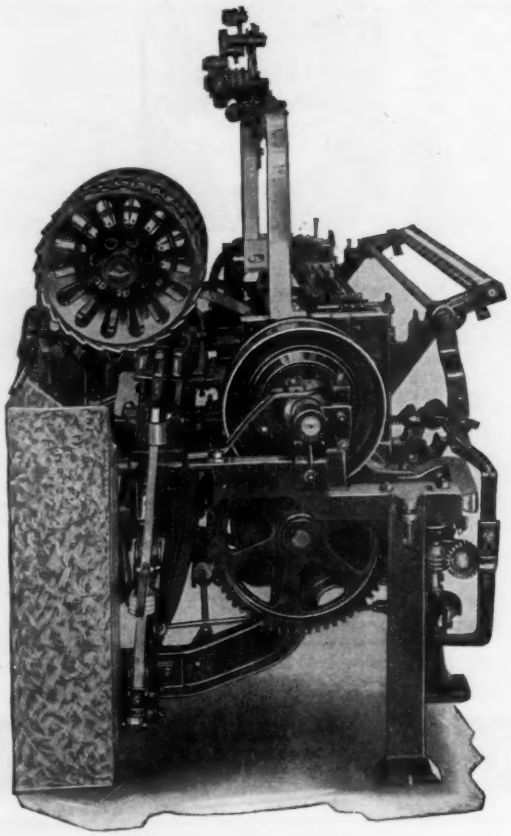
Dept. A, Cleveland, Ohio



The Latest

NORDRAY

Automatic Loom

Multiple-harness, Feeler type

built by

HOPEDALE MANUFACTURING CO.

at MILFORD, MASS.

SOUTHERN OFFICE at
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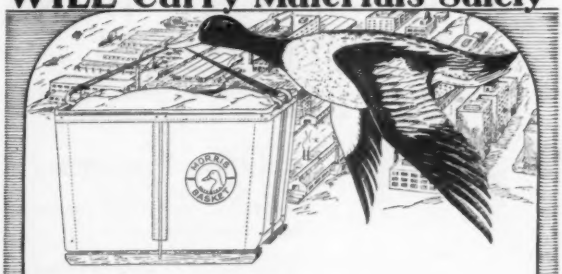
This loom was shown at the Late Greenville Exposition and excited great interest.

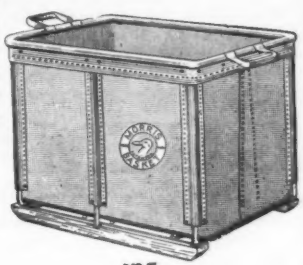
It is Still the Simplest.

WILL Carry Materials Safely



A Morris Duck Basket is strong. Muscles of tough Round Spring Steel—covering of heavy cotton duck. Therefore, every class of material—from heavy to fragile—is guarded against damage.

Morris Duck Baskets are made in every size and type demanded by mill operations. Furnished with either steel or wooden runners.



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Morris Steaming Baskets and Shipping Hampers are equally efficient.

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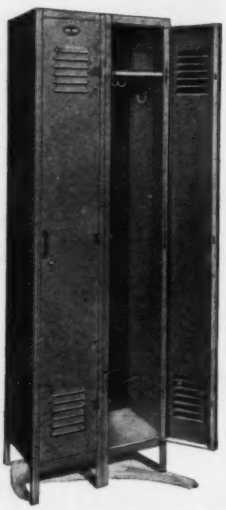
"NO BETTER BUILT THAN
DURABILT"

The slogan speaks for itself. The DURABILT Steel Locker is distinctively a Product of Quality.



Exclusive Features

1. Concealed, one-piece, automatic Latching Device.
2. Straight-lift stamped-steel (not cast) Handle.
3. Five-knuckle, full-looped, double-wear "strap" Hinges.
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We are also manufacturers of steel storage and wardrobe cabinets.

With our modern factory devoted EXCLUSIVELY to the manufacture of steel lockers and cabinets we are prepared to render unexcelled service on your requirements.

DURABILT STEEL LOCKER CO.
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Protect Your Workmen

—with a refreshing drink bubbling from a *sanitary fountain*. Only the water touches their lips where R-S Drinking Fountains are in service. And a cool, invigorating flow of water is always theirs. They will be healthier, more contented workers—and it will be favorably reflected in production.

Install R-S Fountains *NOW*. They will do a big job in your plant and will only take up a small space. They work the hardest when the weather is the warmest. Remember their exclusive sanitation feature—*lips cannot touch the nozzle.*

Write for our new illustrated catalog and prices.

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57 FOURTH STREET MILWAUKEE, WIS.

R-S "Lips can't touch the R-S nozzle" R-S

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BALING-PRESSES

For Waste—

Hand-operated Balers—
Deep-box power Balers—
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High-density power Balers—

There is a LOGEMANN baler for every purpose.

Write for details specifying your needs.

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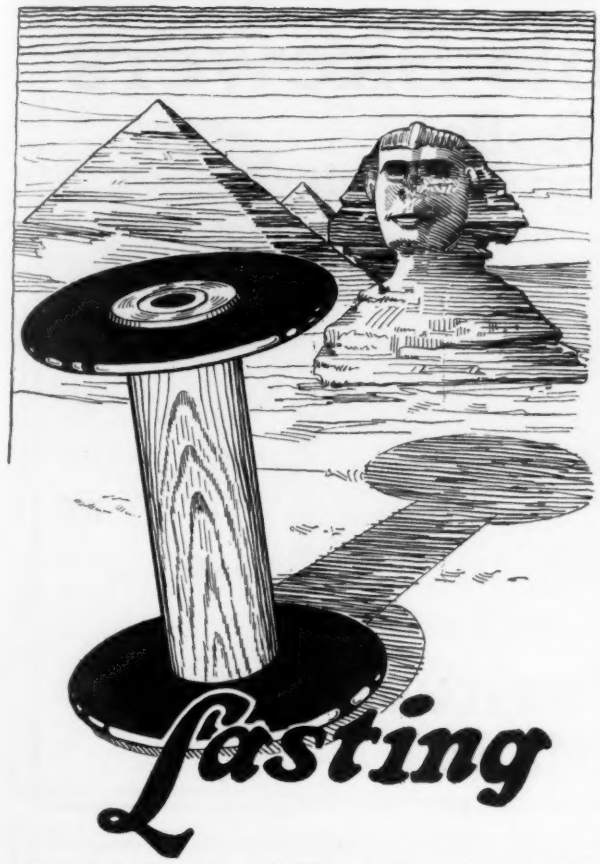
3102 BURLEIGH ST. MILWAUKEE, WIS.

You All KnowThis Box



A spool that had the long lasting qualities and that would remain smooth and run true without the head breaking, splintering or coming off—such a spool has long been in demand by the textile industry.

Many spools have been designed to supply this demand—many of them are good—but in the Smil-Bob Spool we believe we have the last word in spool construction and back this belief with the reputation of the entire L. C. Smith Bobbin Works.

As the sphinx and pyramids stand for permanence, so the Smil-Bob stands for the longest lasting spool that can be made. Its red, gray and black vulcanized fibre head is indestructible—it won't crack, chip or come off. The specially selected hardwood barrel is precision turned so that it will run true and perfectly balanced throughout its long life.

Smil-Bob Spools are real investments in spools. The saving they will effect in preventing yarn wastage, spool replacement, time and trouble will mean thousands of dollars in the pockets of textile mills this year.

Ask for full information and prices today.

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PHILLIPSBURG, N. J.

Exclusive Selling Representative:
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Indestructible
SMIL-BOB
Fibre Head SPOOLS

ALLEN COMPANY

PATENT

WOODEN BEAM HEADS SECTION BEAMS and COMBINATION SECTION BEAMS

Allen Company Wooden Beam Heads are practically unbreakable, insuring longer life, are lighter in weight which insures ease of handling and also a great saving in freight charges. Out of the thousands in use, not one complaint has been received of one broken causing loss of yarn or expense of rewinding.

Constructed of three pieces of selected scientifically kiln dried Beech lumber, securely glued together under heavy hydraulic pressure. Accurately turned on centers. Protected on outside diameter from splintering and general wear by cold shaped upset steel tires. Finished by a water-proofing process and painted any desired color.

The Combination Section Beam has met requirements long demanded in that it is stronger, reduces loss from bent shafts, and is better adapted for storage and shipping of yarn. It is stronger, being built around the pipe and not the shaft itself. Inner heads, being driven on pipes under great pressure, are thus secured without use of wedges or metal flanges. Staves of barrels are fastened to inner heads by countersunk screws. Heads are held on barrels by means of stay-bolts, passing through entire length of beam. Leverage on heads is lessened in so much as point of contact with beam is farther from center. Shaft passes through pipe. is accurately centered and held in pipe by taper nuts. If bent, release nut, remove shaft, straighten, then return to pipe. By removing shaft, loaded beams can be stood on end, making great saving in space for storage. Furnished complete with shaft, and can be used with either wooden or metal heads.

In our Old Style Section Beam, shafts of rolled steel instead of soft steel as commonly supplied, is used, thus greater strength is insured. Inside heads milled and forced on shaft under great pressure. Staves secured to inner heads by screws, holes being bunged to insure smooth surface on barrel. May be used with any make of head. Can also be furnished with lengthwise stay bolts to hold the heads on.

Allen Company Products, tried under your own conditions, will prove profitable investments. Catalog showing the complete line gladly furnished on request. Ask for it today.

Allen Company,
New Bedford, Mass.

Manufacturers of
Wooden Beam Heads, Section Beams, Loom Beam Heads, Top Beams, Beam Trucks, Box Trucks, and other wooden specialties.

Southern Representative:
Carolina Specialty Co., Charlotte, N. C.

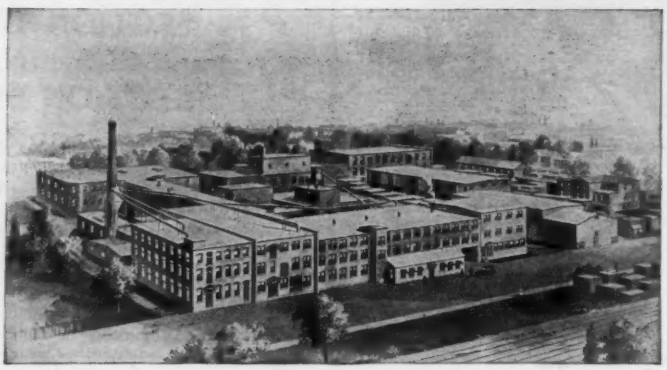
Bobbins Spools Skewers
Tubes Rolls
Manufacturers and Enamelers

OUR CUSTOMERS SAY

The careful attention that we give to the manufacture of their requirements means a stronger and more reliable Bobbin for them, while to us it means repeat orders.

We put all styles of reinforcements on Bobbins and Spools for conditioning of yarns.

All Bobbins enameled by our own process.



OUR PRODUCTS WHATEVER YOU USE WE MAKE

For service and prompt attention write us.

Walter L. Parker Co.
Lowell, Mass.

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WHITINSVILLE
SPINNING RING CO.
WHITINSVILLE, MASS.
SPINNING RING
SPECIALISTS
ESTABLISHED OVER FIFTY YEARS
DIAMOND FINISH

All Steel Loom and Section Beam Heads

Cannot Break
Do not Bend

"ALL STEEL" LOOM BEAM HEAD
"MALLEABLE" GEAR
PATENT PENDING

"ALL STEEL" SECTION BEAM HEAD
PATENTED

"ALL STEEL" ADJUSTABLE HEAD
SPLIT OR SOLID TYPE
PATENT PENDING

DUPLICATE YOUR CAST IRON HEAD IN STEEL—ELIMINATE ALL BREAKAGE
MAKE YOUR BEAM HEAD INVESTMENT PERMANENT

Mossberg Pressed Steel Corporation

Attleboro, Mass.

Take the Case of Corpus Christi, Texas,

the City that Wants Textile Mills and offers the following inducements to get them:

1. Government, city, state, and navigation district now spending $5,850,000 on Deep Sea Port at this city.

2. Natural Gas, from an unlimited supply, controlled by the city, and delivered to industrial plants as low as 5c per thousand. This Gas measures 918 B.T.U.'s.

3. Competent labor in abundance at 75c to $1.00 for females, and $1.50 for males.

4. Splendid inducements offered in factory sites 40 feet above high tide,, adjacent to 4 railways and docks for deep water harbor.

5. Corpus Christi is a large concentration point for the highest grade uniform hard staple cotton in the entire cotton belt.

6. The climate is equable and work can be carried on for twelve months in the year without expensive building requirements. The atmosphere contains the degree of moisture desirable for making cotton fabrics.

7. Ample banking facilities. Corpus Christi has 3 National Banks, with resources over $8,000,000. This city offers economical living conditions for labor, with unusual opportunities to become home owners.

8. Splendid schools, churches of all denominations. With salt water bathing and fishing as recreations, labor is happy and contented. No serious labor trouble has ever been experienced in this city.

Genuine Cooperation will be given by Corpus Christi Business People to any Textile Mill seeking an Economical Location in this Favored Environ.

Write

Chamber of Commerce

Corpus Christi, Texas

For those of you who did not attend the Textile Show

It was too bad that you missed the many new ideas and improvements that have been developed since the last show.

At "Shuttle Headquarters" for instance, there was an unusually interesting display of Shambow "Custom Built" Shuttles.

They created much favorable comment.

But, because you did not see them at the show is no reason why you shouldn't have an opportunity to see them.

We are prepared to send you a man who will show you shuttles and weaving devices of great interest to you. He is a Shuttle Engineer and should you require it, he is fully capable of redesigning your present shuttle or designing an entirely new model for you.

This expert service won't cost you a cent and may save you much money. Just sign and mail the coupon or write us.

Shambow Shuttle Company
Woonsocket, R. I.

JOHN C. SHAMBOW, Pres. & Treas. — H. H. ULLMAN, V. Pres. & Gen. Mgr.

Philadelphia 42, 431 Bulletin Bldg. — Paterson, N. J., 245 Straight St. — Greenville, S. C., Southern Factory

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SHAMBOW SHUTTLE CO., Woonsocket, R. I.

We will be interested to learn more about the new shuttles, tensions, threaders and other devices without obligating ourselves in any way.

Company .....

By .....

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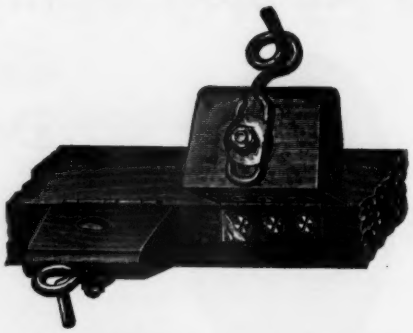
SHAMBOW MAKES

shuttle bills smaller
interruptions fewer
production greater
products better

The Palmer Adjustable Thread Guide



For Ring Spinning and Twisting Frames

Easily Adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

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LOOM HARNESS,
WEAVING REEDS,
OAK TANNED LEATHER
BELTING, STRAPPING,
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We make a specialty of Harness for Warp Drawing Machines

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Stenton Avenue
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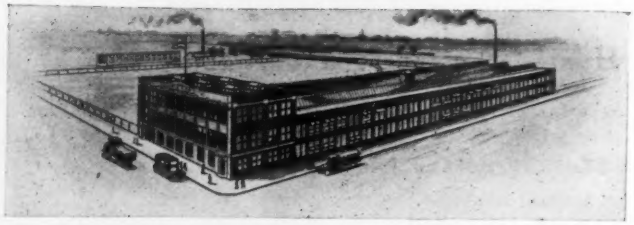

Established 1868

56 Years of
Continuous
Production

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The most modern factory and equipment in the United States for producing
Parts for Textile Machinery

SPINDLES

All shapes, sizes, quantities, materials for all purposes

Bushings, gears, worm gears, bearings, screws, piston rings, tools, jigs, fixtures, etc.

Unexcelled in Quality and Service—Seldom Equalled in Quantity

Grinding, Oil Grooving, Thread Milling, Heat Treating, Machine Work of Precision.

We Manufacture—

LOOM REEDS - - - - - - - - - - - - - -

Heavy Duck and Fancy Reeds a Specialty - - - - -
Also Sliding Hook and Double Bar - - - - - - - -

HEDDLE FRAMES - - - - - - - - - -

Made with Iron or Wood Ends - - - - - - - - - - - - - - -

TWIN STEEL WIRE HEDDLES

With or without Inserted Eyes - - - - - - - - - - - - - - - - - - -

Samples and Prices Furnished on Request.

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Promptly Returned

Tempered Steel Twin and Domestic Iron Wire Heddles
The Best Materials Obtainable Make Up Our Products

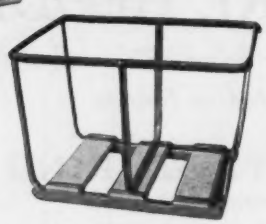
Give us a trial on Cylinder and Doffer Fillets. This will satisfy you as to the merits of our Card Clothing.

Look! Think! Act! Big Savings For You—

Just the basket you have been looking for. A basket that is renewable. When the canvas becomes worn, all you have to do is remove the demountable rim and slip on a new cover, and you have a basket as good as new. A two-thirds savings on the original cost of the basket.

Underneath the canvas cover is a flexible steel frame with cross slats and skids of hard wood. This gives the SMITH'S 100% BASKETS strength and makes them practically indestructible.

Light in weight—sturdy in construction, SMITH'S 100% BASKETS will stand up for years under the roughest usage.



Investigate today
It will mean a saving to you.

SMITH MFG., CO., DALTON, GA

SMITH'S TRADE 100% MARK BETTER BASKETS

MORE
SOUTHERN SPINNERS
are using

AMTEX
TRADE MARK REGISTERED

SPINNING, TWISTING AND SPOOLER TAPE
Than ever before

This increasing demand indicates the superiority of AMTEX Tapes over all others.

We are pleased to build special Tapes for your particular needs.

Send us your specifications and we will guarantee satisfaction.

Manufactured by

AMERICAN TEXTILE BANDING CO., INC.
GERMANTOWN, PHILADELPHIA, PA.
Sold in the South by
Charlotte Supply Co., Charlotte, N. C.
Wilson Company, Greenville, S. C.

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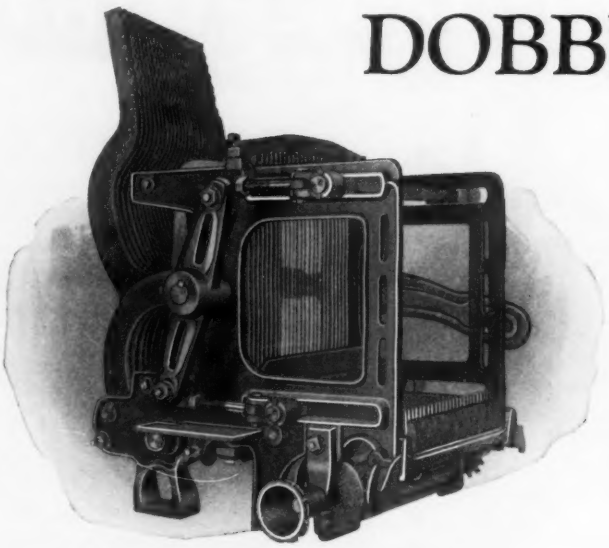


Crompton & Knowles Double Index Dobby

We now equip dobbies of this type with pressed steel hook levers (patented) and drop forged top and bottom hooks (patented).

Slotted fingers and locking rod make it easy to remove, clean, and replace the fingers.

Crompton & Knowles Dobbies can be applied readily to any make or type of loom and will outwear any other dobbies on the market.

CROMPTON & KNOWLES LOOM WORKS

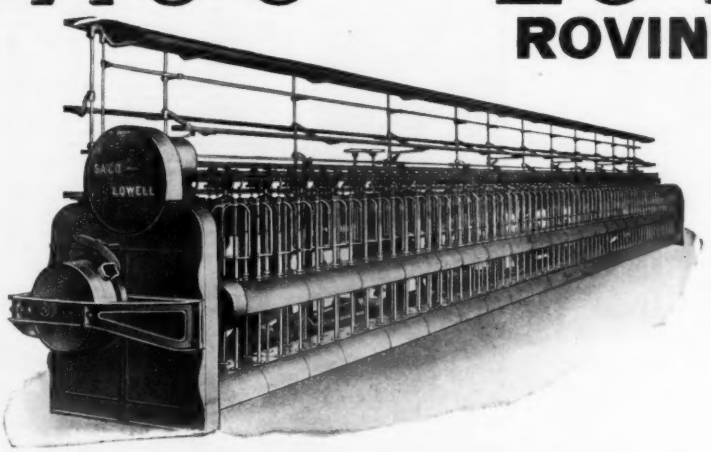
WORCESTER, MASS.

PROVIDENCE, R.I. PHILADELPHIA, PA. PATERSON, N. J.

S. B. ALEXANDER Southern Manager, Charlotte, N. C.

SACO-LOWELL

ROVING FRAMES



Our Improved Roving Frames are economical to operate and give satisfactory service.

Slubbers, Intermediates, Fine Frames and Jacks for all counts of roving. Catalog on request.

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Agent
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Branch Southern Office
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SHOPS:
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Saves Time *Saves Trouble*

The New Eclipse Slub Catcher and Tension Device will prove itself a time and trouble saver for you.

Automatic in operation —it adjusts itself to any size yarn, cotton, wool or silk. It also automatically threads itself.

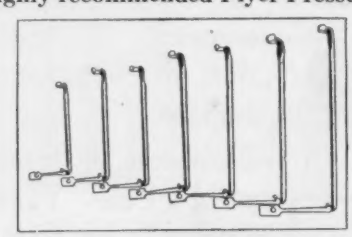
Write today for details.

Eclipse Textile Devices, Inc.
Elmira, N. Y.
Makers of
Eclipse Automatic Yarn Cleaners
Eclipse Automatic Stop Motions
Eclipse Yarn Tension Devices
Van Ness Random Dyeing Machines

ECLIPSE SLUB CATCHER AND TENSION DEVICE

THE THREE MOST IMPORTANT FEATURES

Of our Flyer Pressers are their superior Quality, Service and Dependability—these features have been maintained throughout our twenty-three years of service of supplying to the textile industry our highly efficient and highly recommended Flyer Pressers—



—and has built a remarkable reputation and standard among the thousands of mill owners who use them. Many mills will use no other Flyer Presser.
"Quality features built-in—not talked-in."

Catalog on request.

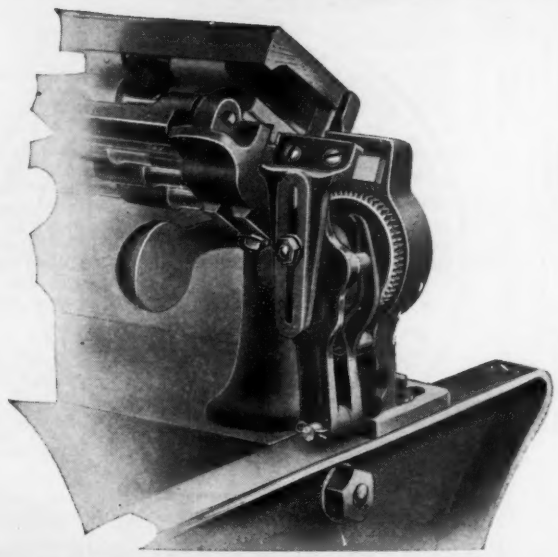
Southern Spindle & Flyer Co., Inc.
"We Manufacture
Overhaul and Repair Cotton Mill Machinery"
Charlotte, N. C.
W. H. MONTY, Pres. and Treas.
W. H. HUTCHINS, V. Pres. and Secy.

Growth A Tribute To Worth
1883
THE reputation of our "Superior" quality products established forty years ago has been maintained through the years, until today our "High Grade" products are demanded and used by the leading textile mills throughout the entire country. The combined organizations at the main plant in Lawrence, Mass., together with three big stock plants in Maine, New Hampshire and Vermont, altogether operating hundreds of skilled workmen, each one of whom takes pride in upholding the reputation established forty years ago, assure textile mills of the most dependable and economical products of their kind to be obtained.
We specialize in complete new mill equipment of Bobbins, Spools, Shuttles, Skewers, etc.
Our "High Grade" Products include:—Plain and Automatic Loom Shuttles, Warp Bobbins, Filling Bobbins, Cant Hoom Bobbins, Plain and Metal Head Warper and Twister Spools, Automatic Loom Bobbins, etc. We particularly call attention to our bobbins and spools fitted with our special metal shields of all types and kinds, also to our enamel finish in any color.
THE DAVID BROWN CO.
"High Grade" Bobbins, Spools and Shuttles
David M. Brown, President
LAWRENCE, MASS.
George Gibson Brown, Treasurer
1924
GOLD MEDAL
SILVER MEDAL
The David Brown Co.
Lawrence, Mass.

WHITIN MACHINE WORKS

ESTABLISHED 1831

TEXTILE MACHINERY



The Efficiency and Durability

of

LEATHER TOP-ROLLS

are increased by the use of

WHITIN

VARIABLE TRAVERSE MOTION

All Whitin Ring Spinning Frames are equipped with this device

MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE N.C.

How About Your Loom "Firing Line?"

Shuttles are the "firing line" of the loom. They contribute more than any other one factor in the weaving of your goods. Here the brunt of the wear and tear must be borne. Here also there must be perfect co-ordination if the right results are to be obtained.

As rigorous as the job demands and built with a precision that is indicative of thorough familiarity with weaving processes, Williams Shuttles play a vital part in loom production. They are made by experienced workers who take just pride in their product. Williams Shuttles are procurable in sizes for all makes of automatic looms. Are you interested in a plan for the reduction of your shuttle investment? Let us tell you about it.

The J. H. Williams Company

"THE SHUTTLE PEOPLE"

MILLBURY MASS.

George F. Bahan, Southern Representative, Charlotte, N. C.

We Solve Roofing Problems

We have solved roofing problems of all kinds for 43 years throughout the South. Our roofing experts are at your service, no matter how large or how small your problem. We not only supply the best material obtainable but see that it is applied in the most efficient manner to give the longest and most satisfactory wear.

Consult us on your roofing problems. We can furnish or install any class of roofing desired.

Ask for quotations on

Gravel and Slag Roofing
Waterproofing **Insulated Roofing**
Tar Concrete Floors
Felt Roofing **Composition**

C. P. MURPHY'S SONS
Established 43 Years ATLANTA, GA.

"Dixie's Reliable Roofers"

Write today for prices.

Approximately 1,500,000 Barrels "Royal Cement" Shipped Into Southeastern States Last Year

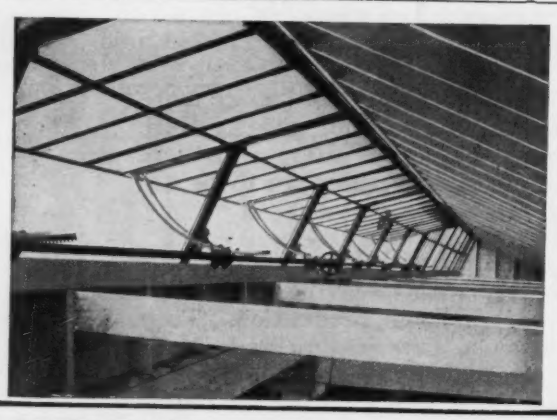
DIXIE PORTLAND CEMENT CO. ROYAL CHATTANOOGA, TENN.

Is tested in our laboratory every 60 minutes. The quality of our product is only equaled by our service in the handling of large jobs.

DIXIE PORTLAND CEMENT CO.
CHATTANOOGA, TENN.

GEORGE DOWMAN
610-611 Walton Bldg., Atlanta, Ga.

Southern Selling Agent for Quality Products plus "Dowman Service"



Callahan Ventilation For Better Production

Callahan Sash Operators give the greatest degree of opening and are the least expensive in the long run. They may be used on either long or short runs of sash and may be either manually or electrically operated.

Callahan Sash Operators

are neat in appearance—positive in action and easy to operate. Simple to install in old or new buildings. Estimates gladly furnished from blueprints. Send for catalog.

THE T. J. CALLAHAN CO.
804 S. PERRY STREET DAYTON, OHIO

GEORGE DOWMAN
610-611 WALTON BLDG., ATLANTA, GA.

"DOWMAN SERVICE" IS KNOWN ALL OVER THE SOUTH. TAKE ADVANTAGE OF THIS SERVICE WHEN IN NEED OF ANY OF THE FOLLOWING:

FIRE PROOF DOORS
SOLID STEEL SASH
HOLLOW METAL WINDOWS
STEEL CASEMENTS
VENTILATORS
METAL CEILINGS
STEEL BUILDINGS
METAL LATH
STEEL FENCE
SASH OPERATORS
OVERHEAD CARRIERS
ETC.

SEND FOR CATALOGS AND PRICES

Zemco-lite

TRADE MARK

The Perfect Mill White

Made from pure white Portland Cement, ZEMCO-LITE possesses the same qualities and characteristics of the walls themselves and when once applied sets and hardens and becomes a part of your wall.

ZEMCO-LITE has light reflecting qualities that will startle you. It gives a flood of soft white light that minimizes shadows and is absolutely free from glare.

Mixed with water (like cement) and applied to the walls of your mill, it is there to stay. It has a non-porous surface that will not catch dust and dirt, will not chip, peel, crack, flake or fall off.

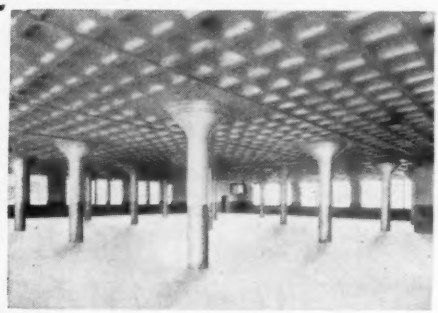
Now is a good time to get more light in your plant. Let us send you full details.

Zemco-lite is also made in a variety of colors for every kind of interior or exterior painting. Color card will be gladly sent on request.

AMERICAN CEMENT PAINT CO.
Chattanooga Tenn.

Zemco-lite being a perfect non-conductor of heat, makes an excellent covering for steam pipes. It is the most economical means of minimizing losses from steam radiation.

The Cement Paint



A mill white that retains its cheerful brightness

It is remarkable the way Wahcolite will lighten the interior of a factory. This wonderful mill white diffuses light to every corner.

Many large manufacturers find Wahcolite most economical. Time cannot turn it yellow. It will not chip, crack or peel.

Send today for complete information about this master finish. Write for your free copy of our booklet No. 19, "Keeping in the Spotlight."

WADSWORTH, HOWLAND & CO., INC.
Brooklyn Boston Jacksonville

WAHCOLITE
A Bay State product

Ware Paint Co.

Wood Preservatives, Stains, All colors Metallic and Composition Paints

SAVE THE SURFACE WITH W WARE WEATHER PAINTS TRADE MARK REG.

Barn Paints, Roof Coating Roofing and Roofing Materials

Atlanta, Ga.

Defeats the Costly Ravages of Weather and Wear

Makes all surfaces—wood, metal or composition — moisture proof; rust proof; rot proof.

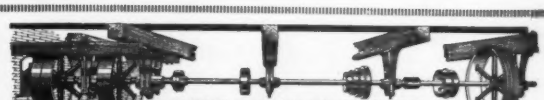
Adds years of serviceable life to every part of the mill. Best of insurance against replacement or repair costs.

Used and recommended by Industrial Plants and Cotton Mills, everywhere.

Distributors of FLINTKOTE Roofing.

Our Application Department will be glad to give you estimates on applying new roofs.

Our Service Department at your call—any time—anywhere.



CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also precede merit as surely in machinery as in men.

Time, skill and effort must also precede merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

CRESSON-MORRIS COMPANY

ENGINEERS—FOUNDERS—MACHINISTS

PHILADELPHIA, PENNA.

T-U-P-E-L-O

is a species of lumber that might well be said to be "grown to order" for

TEXTILE MILL FLOORS, PLATFORMS

and other places and uses where "wear and tear" must be expected and provided for. *Leave it to TUPELO!*

This Softwood Hardwood has an "involved" grain which keeps it from slivering or splintering. A TUPELO floor wears smooth because it wears little—always looks well, because TUPELO has a fine, white color and a satiny sheen.

We'll gladly tell you the whole, interesting story of TUPELO if you'll write and say "we're listening."? When? TODAY?

SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION

805 Poydras Building, New Orleans, La. or 805 Graham Building, Jacksonville, Fla.

(Please address the office nearest you)

A Real Service

Permanently Linked With the Interests of Southern Mills

For over a quarter of a century, the J. B. McCrary Company have been purveyors of progress and prosperity in civic improvement. We do not pose as public benefactors nor purveyors of charity, but believe in helping ourselves by adding to the welfare of humanity.

Our business is to act as engineers, architects, financiers, contractors and supply municipal improvements for cities, towns, small municipalities and mill villages. Our aim is to give the best possible service at the lowest possible cost and add to the health, wealth and happiness of the mill and its employees.

Our record throughout the Southern States is an open book. We have designed or built over 700 water, light and sewer systems for Southern communities and over 5000 miles of hard surface street paving and highways amounting to over Two Hundred Millions of Dollars.

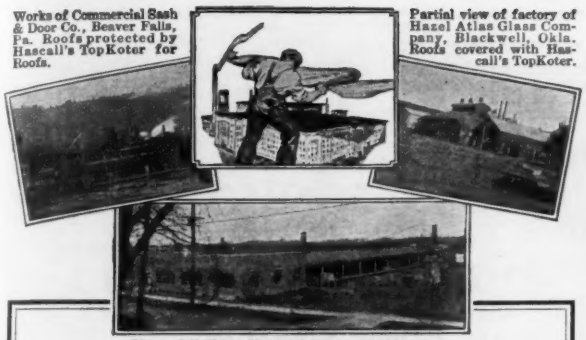
Our operations are based on scientific experiences. Hazard, risk and uncertainty are eliminated. McCrary experienced service can be secured at a fraction of the cost you would have to pay through any other source.

Call on us or have your architects call us in conference when village improvements are under consideration.

The J. B. McCrary Co.

Engineers, Contractors **ATLANTA, GA.**

Waterworks, Sewers, Pavements, General Village Improvements.



Works of Commercial Sash & Door Co., Beaver Falls, Pa. Roofs protected by Hascall's TopKoter for Roofs.

Partial view of factory of Hazel Atlas Glass Company, Blackwell, Okla. Roofs covered with Hascall's TopKoter.

Plant of Hoffman Heater Company, Lorain, Ohio. Hascall's TopKoter for Roofs used throughout.

With Nature's Help, *Hascall's TopKoter* Will Add Many Years to the Life of Old Roofs!

WHY tear away your old roof and replace it with a new one? It's a needless expense Today. Nowadays the most efficient way is to leave the old roof intact and treat it with **Hascall's Topkoter** for Roofs, the original asbestos water-proofing compound *that is vulcanized to the old roof by Nature!* And during the time it is being applied there need be no cessation of the work in the building undergoing re-roofing.

Sold Direct at Rock-Bottom Prices

We specialize in water-proofing materials for roofs and produce them on a quantity production basis. Thus we are able to furnish you with a high-grade, dependable roofing material at rock-bottom prices. *For twenty years we have been selling the largest users of roofing in the country.*

Our Special Roofing Service Department

We maintain a special roofing service department composed of expert engineers for the examination of roofs. This department makes recommendations based upon the examination, and is at your service at any time for any roofing problem that warrants this special survey. It will obligate you in no way to refer your roofing problems to this department.

Guaranteed—Shipped on Approval

Hascall's TopKoter for Roofs is guaranteed to give satisfaction. We will ship you on approval all you may need to water-proof your roofs, without obligation to pay until you are entirely satisfied. **Hascall's TopKoter** for Roofs is always shipped in air-tight, non-leakable, friction-top steel drums.

Acid-, Alkali-, and Water-Proof

Hascall's TopKoter for Roofs is made of the finest grade rock asbestos fibre combined with carbon gums, and water-proofing oils and pitches. This combination makes it absolutely acid-, alkali- and water-proof.

Cures Under Nature's Own Conditions

Hascall's TopKoter for Roofs is not a paint. It makes a flexible, fire-retarding, water-proof covering ten times as thick as a paint film. And—it does not dry like paint, *but "cures" slowly and surely under Nature's own conditions.* It adheres firmly to any kind of roof—old or new. It actually covers the surface "like a rubber blanket".

Easily Applied by Any Laborer

Hascall's TopKoter for Roofs comes ready mixed, and is easily applied. It is simply flowed on with an ordinary roofing-brush Any day-laborer can obtain the same successful results as an expert roofer.

THE HASCALL PAINT COMPANY
WEST 70th AT N. Y. C. R. R. CLEVELAND, OHIO

Hascall's
ESTABLISHED 1904
TopKoter for ROOFS

Some Well-Known Users of Hascall's TopKoter for Roofs:

Jones-Laughlin Steel Company, Pittsburgh
Wills Sainte Claire, Inc, Marysville, Mich.
Missouri Pacific Railroad, St. Louis, Mo.
Arthur Brisbane, New York City
Hazel Atlas Glass Company, Blackwell, Okla.
Commercial Sash & Door Co., Beaver Falls, Pa.
Libby, McNeil & Libby, Chicago
Atlas Powder Company, Wilmington, Del.
Pilsen Fdy. & Iron Wks. Chicago
Steel and Tube Company of America, Chicago
Standard Steel Car Co., Hammond, Ind.
Sadie Cotton Mills, Kings Mountain, N. C.
Seaboard Oil & Guano Co., Chincoteague, Va.
Moline Plow Works, Poughkeepsie, N. Y.
Booth Fisheries, Chicago
American Car & Foundry Co., Berwick, Pa.
Hoffman Heater Co., Lorain, O.

Explain Your Roofing Problems to Our Service Department

If you have a roofing problem, write to us stating size and character of the roof or roofs needing attention. We'll give you our advice in detail. We have been furnishing this kind of service for years to many thousands of users of roofing.

HASCALL PAINT CO., West 70th at N. Y. C. R. R., Cleveland, Ohio
Please send me full particulars on Hascall's Topkoter for Roofs.

Name _____
Street _____
City _____ State _____

Perfected by Cyclone

Cyclone was first to perfect the process of Heavily Zinc-Coating (or Hot-Galvanizing) Chain Link Fence Fabric by Hot-Dipping Process AFTER Weaving. Cyclone "Galf-After" Chain Link Fence Fabric represents the highest development in this new type of fence. Uniformly zinc coated. No lumps; no frozen or soldered intersections. "Galv-After" Fence Fabric lasts years longer. No annual painting required.

Complete information about "Galv-After" Chain Link Fence and Cyclone Service sent on request. We also manufacture Iron Fencing and Gates for all purposes. Address nearest offices; Dept. 35.

CYCLONE FENCE COMPANY
Factories and Offices:
Waukegan, Ill.; Cleveland, Ohio; Newark, N. J.; Fort Worth, Texas; Oakland, Calif. (Standard Fence Co.); Portland, Ore. (Northwest Fence & Wire Works).

CYCLONE
"Galv-After" Chain Link
FENCE FABRIC

PROPERTY PROTECTION PAYS

WARREN'S
COATEX
TRADE MARK

A TRADE-MARK that has become known throughout the Southern Textile Industry as a standard of High Quality and Prompt Service on

PAINT AND VARNISH PRODUCTS

For the Textile Mills

For over ten years, members of the Warren Company have been studying the paint problems in textile mills and mill villages and selling them paints, varnishes and glass to meet their special requirements. The knowledge and experience they have gained are at your command. We invite your inquiries and the opportunity of consulting with you. No obligation on your part.

THE WARREN COMPANY

Paint and Glass Division

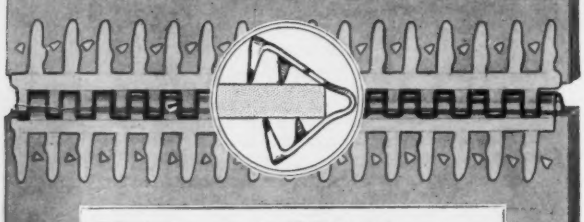
875 E. FAIR STREET ATLANTA, GA.

Manufacturers of Paint and Polished Mirrors. Jobbers of Plate and Window Glass.

ALLIGATOR

TRADE MARK REG. U. S. PAT. OFFICE

STEEL BELT LACING



Uninterrupted Belt Service

When you lace a belt with Alligator steel lacing, you probably will never have to touch the lacing again as long as the belt runs unless you want to shorten or lengthen the belt—and if you do, the joint is already half made. A separate hinge lacing, smooth and flexible. "Just A Hammer To Apply It."

FLEXIBLE STEEL LACING CO.
4619 Lexington St., Chicago, Ill., U. S. A.
In England at 135 Finsbury Pave., London, E.C.2

"Every Tooth A Vise"

For Every Size and Kind of Belt

Stretched Laps Make Poor Work

And with ordinary rollers in the lap heads on lappers, the lap rod is so hard to turn that the lap is stretched by pulling hard enough on it to cause it to turn. Ball bearing rollers can be put in your present heads in a few minutes at small cost. Send us an order, giving the kind of lap heads you are now using.

AldricH MachinE

Ball WorkS Bearings

Greenwood, S. C.

"Save the surface and you save all" Paint & Varnish

A Straight Talk To Good Buyers

Year after year nature works to show us that man's keenest chemical knowledge is pitted against ruthless, though invisible, destructive forces, and therefore cheap products are foredoomed to early decay—this is vividly true of paints and varnishes.

Cooledge Hygrade Paints and Varnishes are made specifically to meet the attacks of the Southern climate, and *they do wear longer.*

Perma-Gloss Mill White Enamel

Pure white, high gloss, long wearing enamel. Flows easily—covers solidly. Unsurpassed for sanitary, low priced finishes on walls and woodwork.

Bungalo Shingle Stain

Made of selected, sun-resistant colors and freshly refined creosote and pure oils. Service and protection in unusual measure.

C-H Mill Cottage Paint

Every ingredient selected to stand the long day, harsh grilling of the Southern climate. An extraordinary wear service assured. A low price per gallon. A genuinely great value.

Perma-Tint Kalsomine

A greatly improved kalsomine. Goes farther, covers solidly and wears much longer and better than ordinary kalsomines. In white and all standard tints.

Cooledge Hygrade Varnishes

Over forty years' experience have taught us to make Varnishes that combine high quality, great durability and prices that cannot be matched by other makers—quality for quality.

Our plant is numbered among the good plants of the United States. The quality of our products is unvarying. We can quote you prices that mean tangible cuts in your upkeep costs. Tell us your present requirements—then compare our quotations with those offered by any other manufacturer of strictly first class products. SAVE THAT DIFFERENCE.

Write *today* for our prices on any paint or varnish requirements.

COOLEDGE CH HYGRADE
Paints and Varnishes

Manufactured by

F. J. COOLEDGE & SONS

ATLANTA SAVANNAH CHARLOTTE

Get *steady* speed from your bicycle drives

STEADY spinning speed requires a belt which won't slip. In order not to slip, the belt has to be "made for the job."

You'll find this belt in the Graton & Knight Standardized Series—a grouping of brands of Graton & Knight Leather Belts. The right belt for the right job, all through the mill as well as for your spinning frames.

All Graton & Knight Standardized Series belts are made of rugged, honest leather. The *standardized* belt for spinning frames is pliable and pulley-hugging. It pulls steadily without slippage. It is remarkably free from stretch. Does not require constant taking-up. It is, in short, the ideal belt for this use.

The other brands of Graton & Knight Standardized Series are made just as carefully for their particular work. And all are held to rigid standards of quality to guarantee uniform replacements.

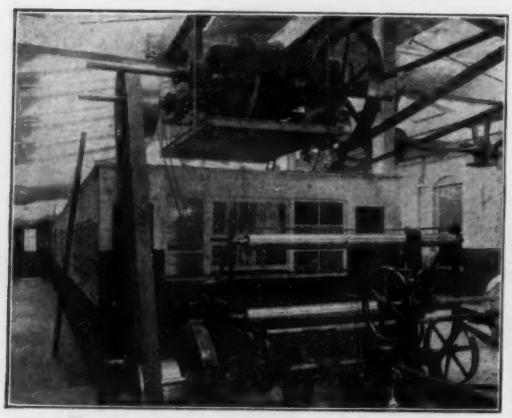
Book 101 O tells how textile mills can save money with Standardized Leather Belts. Write for a copy to-day.

THE GRATON & KNIGHT MFG. CO.
Worcester, Mass.

GRATON & KNIGHT
Standardized
LEATHER BELTING

Nothing takes the place of Leather

GRATON & KNIGHT



No. 6 REEVES Transmission Driving Tenter Frame.

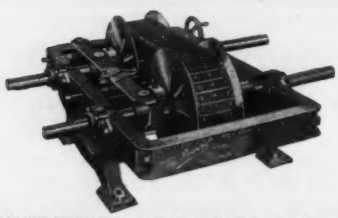
"CONSTANTLY IN USE SINCE 1907"

". . . . two Reeves Transmissions constantly in use .. since 1907 .. have not spent one cent in repairs on either since we installed them."

W. H. MAYER & SONS CO.
New York City.

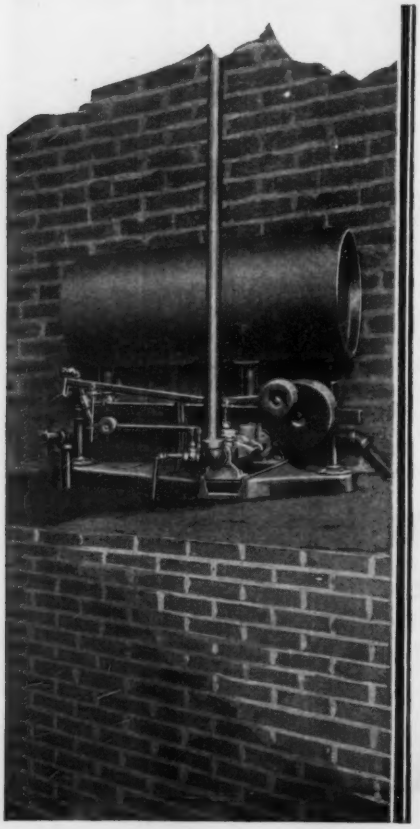
THIS is just one of the many instances of Reeves economy and dependability through long years of service. The Reeves Transmission is the only truly accurate means of variable speed control. Easy to install. Simple to operate. Pays for itself in a short time. Lasts for years. Write today for catalog "C" and full information.

REEVES PULLEY COMPANY, Columbus, Ind.



"The Reeves"
VARIABLE SPEED
TRANSMISSION

INDUSTRY COMES TO REEVES FOR ACCURATE SPEED CONTROL



Condensation May Be Eating Into Your Profits!

Condensation is not an item of expense that shows up in your profit and loss statement but it is a definite factor in your overhead nevertheless. Every month your accountant writes off a certain definite amount of money and charges it to condensation—whether he knows it or not.

Condensation retards steam circulation and cools your dryers, slashers, service heaters, and other steam heated apparatus. You can't prevent the formation of condensation but you can drain it off as it forms and returns it to the boiler at high temperature with a Morehead Back-to-Boiler System.

Your steam will circulate freely and your equipment will function at a high efficiency point. You will no doubt be interested in reading a number of reports from plants where Morehead Back-to-Boiler Systems are effecting big savings. Write for them.

Morehead Manufacturing Company
Dept. C—Grand River Ave. at Warren
DETROIT, MICH.

(128)

Morehead
"BACK-TO-BOILER-SYSTEM"
POSITIVELY DRAINS ALL TYPES OF STEAM APPARATUS. DELIVERS CONDENSATION AND FEED WATER TO BOILERS UNDER ALL CONDITIONS AT MAXIMUM TEMPERATURE

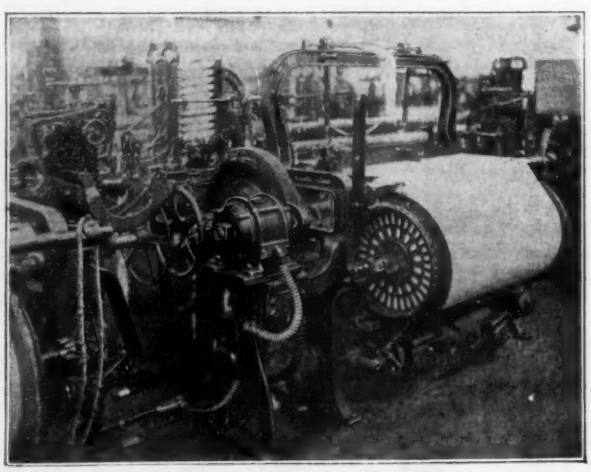
$10,000 a Year Saved by

"Buffalo" Ventilating System

According to C. E. Firth, V.-P., Firth & Foster, Philadelphia, who adds, "Elimination of Steam in dye houses ends trouble with spoiled goods and improves morale."

BUFFALO FORGE COMPANY 460 BROADWAY BUFFALO, N. Y.

Loom Motors



Allis-Chalmers Loom Motors for individual drive are designed especially for this class of service.

They are totally enclosed, thereby eliminating any trouble for dirt or lint getting into the motor; equipped with waste packed bearings, minimizing the required attention; have tapered shaft for the ready mounting and dismounting of pinions and are arranged for conduit connections.

Send for Textile Bulletin

ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN, U.S.A.

District Offices in All Leading Cities.

ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers

They never fail to back our claims

We claim that the Moccasin Bushing is the most reliable equipment you can install in your Textile Machinery, in loose pulleys or in any other bearing that has proved troublesome.

The Moccasin requires oiling but a few times yearly. It supplies clean, filtered oil to the bearing surfaces. It minimizes friction and lasts indefinitely.

These are our claims and

Moccasin Bushings

have backed them up to the letter.

Study the make-up and you will readily perceive the mechanical perfection of the Moccasin—will see why it is superior to any other bushing for high speeds and heavy loads. The phosphor bronze body is fitted with white pine oil feeding plugs, as shown in the cross section cut below. They function on the same principle as the lamp wick—capillary action—a law of nature as dependable as the law of gravity.

The oil is sealed in. There is no waste—no drippage to damage belting, floors or stock.

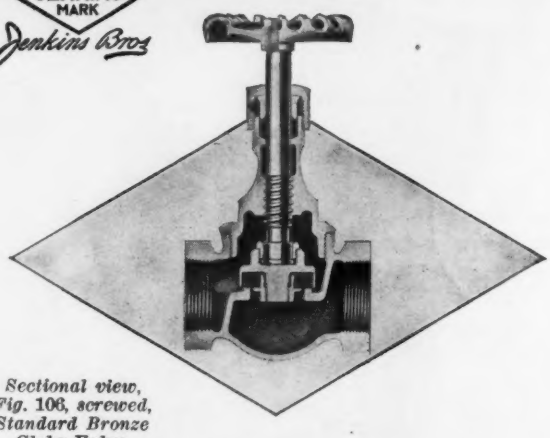
MOCCASIN BUSHING CO.

CHATTANOOGA, TENN.

Made for maximum service not merely the average

TRADE JENKINS MARK

Jenkins Bros



Sectional view, Fig. 106, screwed, Standard Bronze Globe Valve.

Fig. 108, screwed, Standard Bronze Angle Valve.

Fig. 144, flanged, Standard Iron Body, Angle Valve.

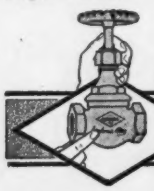
It pays to use Jenkins Valves throughout

They are essentially built for long service and hard usage. All parts are made heavy and strong—nothing is skimped. And this sturdiness of construction of the Jenkins Valve, together with a well-proportioned improved design, help materially in enabling the user to get the best results out of any piping system.

Many plants realize the importance of this. They appreciate the service only genuine Jenkins Valves can give, and for this reason are using Jenkins throughout. Jenkins Valves are supplied for practically all valve requirements. At mill supply houses everywhere.

JENKINS BROS.

80 White Street .....New York, N. Y.
524 Atlantic Avenue .....Boston, Mass.
133 No. Seventh Street...Philadelphia, Pa.
646 Washington Boulevard.....Chicago, Ill.

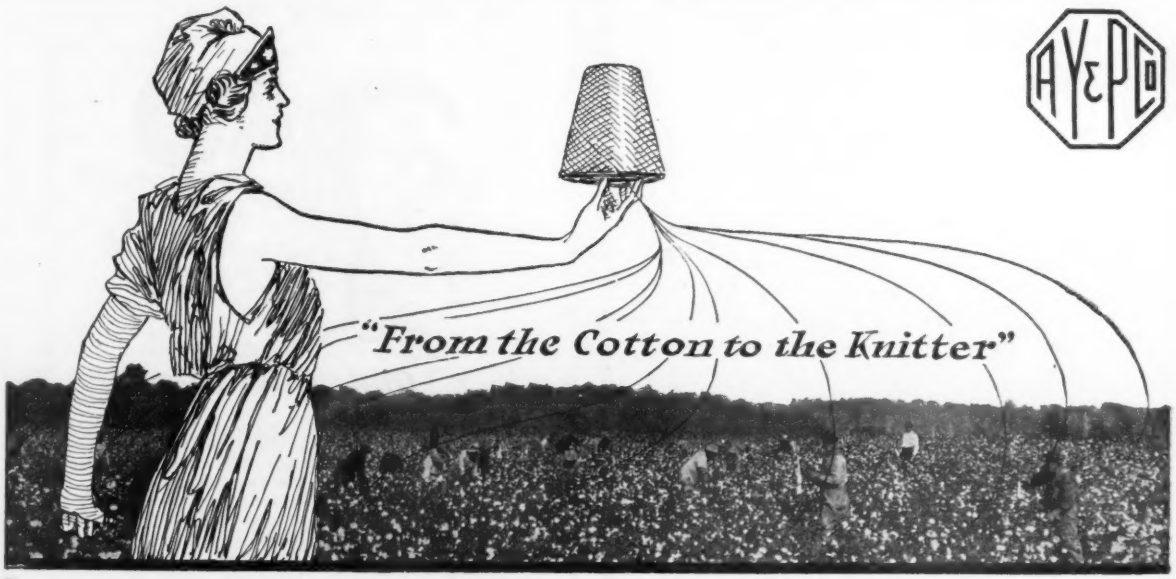


Always marked with the "Diamond"

Jenkins Valves

SINCE 1864

Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Banks, Etc.



AMERICAN YARN & PROCESSING CO.

MOUNT HOLLY, N. C.

SPINNERS AND MERCERIZERS

HIGH GRADE COMBED AND CARDED YARNS—16s to 80s

Our Mercerized Yarns Are the Product of Our Own Mills

General Office, Mt. Holly, N. C.

Representatives

H. B. ROBIE, 346 Broadway, New York City **FORREST BROS., Forrest Bldg., Philadelphia**

Weimar Bros.

Phone Connections

Works, 2046-48 Amber Street,

PHILADELPHIA, PA.

MANUFACTURERS OF

Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

WOODWARD, BALDWIN & CO.

DRY GOODS

Commission Merchants

43-45 WORTH STREET, NEW YORK

HUGHES FAWCETT

IMPORTER AND COMMISSION MERCHANT

LINEN YARNS

For Weaving, Knitting and all Purposes.

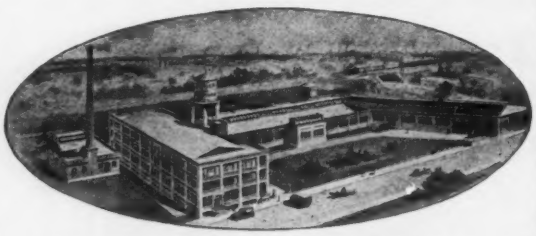
TURKEY RED YARNS

For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine

And Every Description of Linen Thread and Twine

115 Franklin Street, : NEW YORK



View of our Mercerizing and Bleaching Plant

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Established 1908

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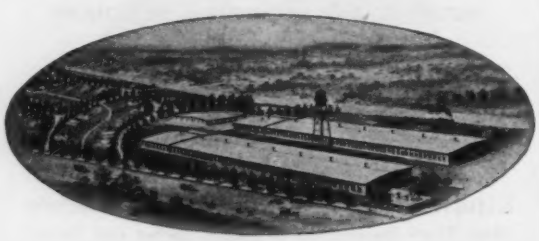

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Fulton Supply Co.
Graton & Knight Mfg. Co.
Jacobs Mfg. Co., E. H.

CHEMICALS.
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CHLORINE GAS.
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.

CLEANING MACHINERY (CLOTH AND YARN).
Rome Mch. & Fdry. Co.

CLEANING AND AERATING MACHINE FOR COTTON.
Murray Company, The.

CLEARER CLOTH.
(See Cloth.)

CLOCKS—HANK, ETC.
(See Counters.)

CLOCKS (TIME).
Root Co.

CLOCKS—WATCHMAN.
Foxboro Co., Inc.
Root Co.

CLOSETS—WATER.
(See Toilets.)

CLOTH (ROLLER, CLEARER AND SLASHER).
Best & Co., Edw. H.
Phila. Felt Co.

CLOTH CUTTERS.
Firsching, J. A.
Foster Machine Co.
Wildman Mfg. Co.

CLOTH ROOM MACHINERY.
Butterworth & Sons Co., H. W.
Firsching, J. A.
Foster Machine Co.
Gessner, David
Hopedale Mfg. Co.
Saco-Lowell Shops.
Textile Finishing Mchry. Co.
Williams Co., J. H.
Wildman Mfg. Co.

CLOTH SHRINKING MACHINERY.
Gessner, David
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Tolhurst Mch. Wks.

CLOTH TESTERS.
Scott Co., Henry L.

CLOTH WINDERS.
(See Winders.)

CLUTCHES—FRICTION.
Allis-Chalmers Mfg. Co.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Fulton Supply Co.
Link-Belt Company.

CLUTCH LININGS.
Carlyle-Johnson Mch. Co.

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General Coal Co.

COAL AND ASH HANDLING MACHINERY.
Link-Belt Company.
Louden Machinery Co.

COAL TAR DISINFECTANTS.
(See Disinfectants.)

COCKS.
(See Valves.)

COLOR PAILS.
(See Buckets—Mill.)

COMB APRONS.
(See Aprons.)

COMBER AND COMBER SUPPLIES.
Foster Machine Co.
Gessner, David
U S Bobbin & Shuttle Co.
Whitin Machine Wks.

COMMISSION MERCHANTS & DEALERS.
(See Cotton Cloth Commission Merchants.)

COMPRESS—COTTON.
Piedmont Bonded Warehouse & Comp. Co.

COMPRESSORS—AIR, GAS, ETC.
Allis-Chalmers Mfg. Co.
Curtis Pneumatic Mchry. Co.
Fulton Supply Co.
General Electric Co.
Goulds Mfg. Co.

COMMUTATOR BRUSHES.
(See Brushes—Motor and Generator.)

CONCRETE REINFORCEMENT.
Birmingham Slag Co.

CONCRETE REINFORCING STEEL.
Ryerson & Son, Inc., Jos. T.

CONDENSERS.
Allis-Chalmers Mfg. Co.

CONDITIONING OVENS—ELECTRIC
Emerson Apparatus Co.

CONDUITS.
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CONE BELT TENSION DEVICE.
Bahan Textile Mch. Co.

CONES (KNITTING YARN).
Foster Mch. Co.
Sonoco Products Co.

CONE WINDING MACHINE.
(See Winding Machinery.)

CONNECTORS—FRANKEL SOLDERLESS.
Westinghouse Elec. & Mfg. Co.

CONSULTANTS (BUSINESS METHODS).
Ernst & Ernst.

CONSULTING ENGINEERS.
(See Architects and Engineers)

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Dowman, George.
Sirrine & Co., J. E.
Truscon Steel Co.

CONTRACTORS—ELECTRICAL.
(See Electrical Engineers.)

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Williams, C. L.

CONTRACTORS (ROOFING).
Dowman, Geo.
Murphy's Sons, C. P.

CONTRACTORS (PAVING).
McCrary Co., J. B.

CONTRACTORS (WATERWORKS).
McCrary Co., J. B.

CONTRACTORS (SEWAGE).
McCrary Co., J. B.

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Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

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(See Belt Conveyors.)

CONVEYING MACHINERY.
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Chisholm-Moore Mfg. Co.
Cresson-Morris Co.
Curtis Pneumatic Mchry. Co.
Dowman, George.
Elwell-Parker Elec. Co.
Fulton Supply Co.
Link-Belt Co.
Louden Machinery Co.
Mathews Conveyer Co.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield, Wm. Co.

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Link-Belt Co.
Mathews Conveyer Co.

CONVEYORS (ROLLER).
Mathews Conveyer Co.

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COOLERS—WATER.
(See Water Coolers.)

COOLING AND CONDITIONING EQUIPMENT.
American Blower Co.
Buffalo Forge Co.

COOLING TOWERS.
(See Tanks and Towers.)

COPPER STAMPS AND STENCILS.
(See Stamps, Stencils, etc.)

CORDAGE MACHINERY.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

CORPORATION FINANCE (TEXTILE).
American Trust Co.

CORRUGATED SHEET STEEL.
Ryerson & Co., Inc., Jos. T.

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Ernst & Ernst.

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Minter Homes Co.

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Murray Company, The.

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(See Blowers.)

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Callaway Mills.
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Fawcett, Hughes.
Hunter Mfg. & Comm. Co.
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Lane & Co., J. H.
Meritzer, H. S.
Moss-McDuffe & Co.
Quissett Mill.
Tolar & Hart.
Weimar Bros.
Wellington, Sears & Co.
Woodward, Baldwin & Co.

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Cooper & Griffin, Inc.

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Atlanta Harness & Reed Mfg. Co.
Bahan Textile Mch. Co.
Barber-Colman Co.
Brown Co., David.
Butterworth & Sons, H. W.
Chapman Electric Neutralizer Co.
Crompton & Knowles Loom Works.
Draper Corporation.
Dowman, George.
Eclipse Textile Devices, Inc.
Emerson Apparatus Co.
Firsching Co., J. A.
Fletcher Works.
Foster Machine Co.
Foxboro Co., Inc.
Fulton Supply Co.
Gessner, David
Graton & Knight Mfg. Co.
Harris Co., Geo. W.
Haskins Co., R. G.
Hopedale Mfg. Co.
Howard Bros. Mfg. Co.
Hunt Machine Co., Rodney.
Hyatt Roller Bearing Co.
Jacobs Mfg. Co., E. H.
Lestershire Spool Mfg. Co.
Lowell Crayon Co.
Mill Devices Co.
Mossberg Pressed Steel Corp.
Parker Co., Walter L.
Phila. Drying Mchry. Co.
Proctor & Schwartz, Inc.
Reutlinger, J. J.
Root Co.
Roy & Son, B. S.
Sargent's Sons Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Shambow Shuttle Co.
Smith Bobbin Wrks., L. C.
Stafford Co.
Steel Heddle Mfg. Co.
Textile Products Co.
Terrell Machine Co.
Textile Finishing Machinery Co.
Textile Rubber Co.
Toledo Scale Co.
Tolhurst Mch. Wks.
U S Bobbin & Shuttle Co.
Walker Mfg. Co.
Washburn & Sons, L. R.
Williams Co., J. H.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

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Fletcher Works.
Foster Mch. Co.
Gessner Co., David
Schaum & Uhlinger.

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(See Yarn Manufacturers.)

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Root Co.

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Dodge Mfg. Co.

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(See Hoists.)

CRAYONS.
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CUTTERS—THREAD.
(See Thread Cutters.)

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Bird-Potts Co., Inc.
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Locke Regulator Co.

DELIVERY CASES.
(See Boxes—Packing.)

DESKS—FACTORY.
Allen Co.

DEXTRINES.
(See Dyestuffs and Chemicals.)

DIAL SCALES.
(See Scales.)

DIES—STEEL.
(See Stamps, Stencils, Etc.)

DIE STOCKS.
(See Pipe Threaders.)

DOBBY CHAINS.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

DOBBY CARDS.
Jacobs & Co., E. H.

DOFFING BOXES—MILL.
(See Boxes—Mill.)

DOFFER FILLETS.
(See Fillets.)

DOFFING CARS.
(See Cars.)

DOORS—STEEL.
Dowman, George.
Mills Co.

DRAWINGS AND ARTWORK.
Jacobs & Co.
Ness, Joseph.

DRAWING FRAMES.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

DRESSING ROOMS (METAL PARTITIONS).
Mills Co.

DRILLS—ELECTRIC.
Carter Electric Co.
Fulton Supply Co.
Perry-Mann Elec. Co.
Independent Pneumatic Mchry. Co.
Westinghouse Electric & Mfg. Co.

DRINKING FOUNTAINS.
(See Fountains—Drinking.)

DROP WIRES.
Draper Corp.
Mossberg Pressed Steel Corp.
Steel Heddle Mfg. Co.
Williams Co., J. H.

DRY CLEANING MACHINERY.
Rome Machine & Fdry. Co.

DRYING APPARATUS.
American Blower Co.
Buffalo Forge Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.

DRYING FORMS—HOSIERY.
Phila. Metal Drying Form Co.

DRYING MACHINERY AND EQUIPMENT.
American Blower Co.
American Laundry Mchry. Co.
Butterworth, H. W., & Sons Co.
Gessner, David
Philadelphia Drying Mchry. Co.
Phila. Metal Drying Form Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

DUST COLLECTORS.
(See Blowers and Blowing Systems.)

DUSTING MACHINERY.
Proctor & Schwartz, Inc.
Schofield & Sons, Wm.

DYERS, BLEACHERS AND FINISHERS.
Aberfoyle Mfg. Co.
American Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.
Franklin Process Co.
U. S. Finishing Co.

DYEING, BLEACHING, FINISHING AND PRINTING MACHINERY AND EQUIPMENT.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Electro Bleaching Gas Co.
Emerson Apparatus Co.
Firsching, J. A.
Fletcher Works.
Franklin Process Co.
Fulton Co.
Gessner, David
Hightower Box & Tank Co.
Hungerford & Terry, Inc.
Hunt Machine Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Rome Machine & Fdry. Co.
Schaum & Uhlinger.
Smith, Drum & Co.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.
Woolford Wood Tank Co., G.

DYEING MACHINES (PACKAGE AND SPOOL).
Franklin Process Co.

DYE BAGS OR NETS.
Smith Mfg. Co.

DYE STICKS.
Phila. Drying Machinery Co.

DYE VATS AND TUBS.
(See Tanks or Bleaching Kiers.)

DYESTUFFS AND CHEMICALS).
American Diamalt Co.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
DuPont de Nemours & Co., E. I.
Ciba Co., Inc.
Cooper & Cooper, Inc.
Electro Bleaching Gas Co.
Fleischmann Co., The.
Ford Co., J. B.
Grasselli Chemical Co.
India Alkali Works.
Kali Mfg. Co.
Klipatein & Co., A.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Newport Chemical Wks.
New Brunswick Chemical Co.
Quaker City Chemical Co.
Roessler & Hasslacher Chemical Co.
Penick & Ford Sales Co., Inc.
Rohm & Hass Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.

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ELECTRIC DYNAMOS AND MOTORS.
(See Motors and Generators.)

ELECTRIC FANS.
(See Fans—Electric.)

ELECTRIC LAMPS.
(See Lamps.)

ELECTRIC LAMP GUARDS.
Perry-Mann Electric Co.
Southern Elec. Supply Co.

ELECTRICAL ENGINEERS AND CONTRACTORS.
Huntington & Guerry, Inc.
McCrary Co., J. B.
Perry-Mann Electric Co.

ELECTRIC NEUTRALIZERS.
Chapman Electric Neutralizer Co.

ELECTRIC LIGHTING ENGINEERS.
(See Illuminating Engineers.)

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Buffalo Forge Co.
Carter Electric Co.
Chapman Electric Neutralizer Co.
Cooper Hewitt Electric Co.
Elwell-Parker Electric Co.
Fulton Supply Co.
General Electric Co.
Independent Pneumatic Mchry. Co.
Mills & Lupton Supply Co.
Perry-Mann Electric Co.
Southern Elec. Supply Co.
Walsh & Weidner Boiler Co.
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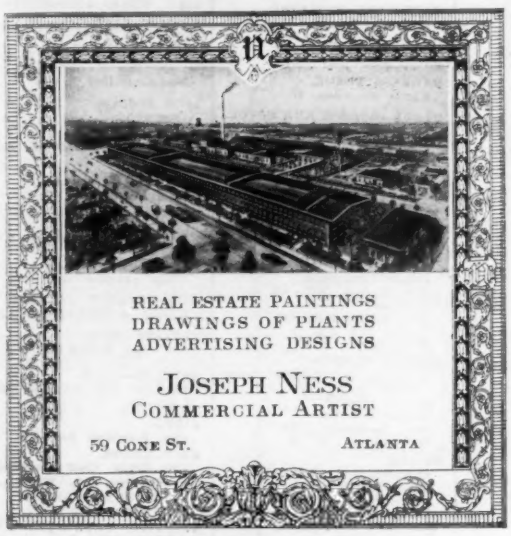
(See Power.)



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Mathews Conveyer Co.

ELEVATORS.
Link-Belt Company.
Mathews Conveyer Co.

ENAMELED IRON AND GLASS FOR TEXTILE MACHRY.
Mitchell-Bissell Co.

ENAMEL—MILL WHITE.
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ENGINEERS—MILL.
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ENGINES—OIL, GAS AND GASOLINE.
Allis-Chalmers Mfg. Co.
Fulton Supply Co.

ENGINES (STEAM).
Allis-Chalmers Mfg. Co.
American Blower Co.
Fulton Supply Co.
Lombard Iron Works & Supply Co.
Toomey, Frank.

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Locke Regulator Co.
Lunkenheimer Co.
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Locke Regulator Co.

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McCrary Co., J. B.

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Bird-Potts & Co., Inc.

ENGRAVINGS AND CUTS.
Jacobs & Co.

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Jacobs & Co.

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American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

FACTORY AND INDUSTRIAL SITES.
(See Industrial Sites.)

FACTORY MANAGEMENT SYSTEMS.
Ernst & Ernst.

FANS—ELECTRIC.
American Blower Co.
Buffalo Forge Co.
Carter Electric Co.
General Electric Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.
Westinghouse Elec. & Mfg. Co.

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FASTENERS—BELT.
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FEED WATER PURIFIERS.
(See Boiler Feed Water Purification.)

FEEDERS.
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FELTING MACHINERY.
Proctor & Schwartz, Inc.

FENCE—STEEL AND IRON.
Cyclone Fence Co.
Dowman, George.

FENCE POSTS—CREOSOTED PINE.
Southern Wood Preserving Co.

FILLETS (CYLINDER DOFFER, BURNISHER AND STRIPPER).
Howard Bros. Mfg. Co

FILLING—CAP AND WARP.
U S Bobbin & Shuttle Co.

FILM (MOTION PICTURE).
(See Theatre Equipment.)

FILTERS—OIL.
Bowser & Co., Inc., S. F.

FILTERS—WATER.
Hungerford & Terry, Inc.

FILTERS (ALUM).
Lennig & Co., Chas.

FILTER CLOTHS.
Smith Mfg. Co.

FINISHING.
(See Dyers, Bleachers and Finishers.)

FINISHING MACHINERY.
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Bosson & Lane.
Ciba Co., Inc.
Cooper & Cooper, Inc.
Corn Products Refining Co.
DuPont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Fleischman Co., The.
Ford Co., J. B.
India Alkali Works.
Kali Mfg. Co.
Keever Starch Co.
Klipstein & Co., A.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
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Newport Chemical Works.
New Brunswick Chemical Co.
Penick & Ford Sales Co., Inc.
Quaker City Chemical Co.
Roessler & Hasslacher Co.
Rohm & Haas Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

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Dowman, George.
Truscon Steel Co.

FIRE HOSE.
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FIRE PROTECTING PAINT.
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FLOORING LUMBER.
Kirkpatrick Lumber & Timber Co.
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Southern Wood Preserving Co.

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Southern Wood Preserving Co.

FLOOR SCRUBBING MACHINE
American Scrubbing Equipment Co.

FLOOR SCRUBBING POWDERS.
(See Scrubbing Powders.)

FLOOR TREATMENTS—CONCRETE AND WOOD.
Truscon Laboratories.

FLOOR SWEEPS.
(See Brushes.)

FLUTED ROLLS.
Howard & Bullough.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FLUX (WELDING).
Bird-Potts Co., Inc.
Oxweld Acetylene Co.

FLYERS.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FOLDING & TURNING MACHINERY.
Foster Machine Co.

FOUNDERS.
Briggs-Schaffner Co.
Cresson-Morris Co.
Lombard Fdy. & Mch. Wks.

FOUNTAINS—DRINKING.
Murdock Mfg. & Supply Co.
Bundle-Spence Mfg. Co.

FRICTION CLUTCHES.
(See Clutches—Friction.)

FURNITURE (FOLDING—CAMP).
Smith Mfg. Co.

FURNITURE—MILL.
Durabilt Steel Locker Co.
Mills Co.
Smith Mfg. Co.

FUSES—ELECTRIC.
Carter Electric Co.
Fulton Supply Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.

GARAGES (PORTABLES—METAL).
Dowman, George.

GARNETT MACHINES.
Proctor & Schwartz, Inc.

GAS ENGINES.
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GASOLINE .LIGHTING .SYSTEMS, LANTERNS, ETC.
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GASOLINE CAMP STOVES.
Smith Mfg. Co.

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Foxboro Co., Inc.
Taylor Instrument Co.

GAUGE—OIL.
Fulton Supply Co.
Lunkenheimer Co.

GAUGES (LIQUID LEVEL).
Foxboro Co., Inc., The.
Lunkenheimer Co.
Taylor Inst. Co.

GAUGES—WATER.
Fulton Supply Co.
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Cresson-Morris Co.
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GEAR PULLERS.
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(See Motors and Generators.)

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Oxweld Acetylene Co.

GOGGLES (WELDING).
Oxweld Acetylene Co.

GLASSWARE AND DISHES
(See Dishes.)

GOVERNORS—PUMP.
General Electric Co.

GRAPHIC CHARTS.
Ernst & Ernst.

GRAPHITE.
Detroit Graphite Co.
Dixon Crucible Co., Jos.

GRATES—BOILER.
Lombard Fdy. & Mch. Co.
Walsh & Weidner Boiler Co.

GRATES—MECHANICAL.
(See Stokers.)

GREASE.
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GRAVEL AND SLAG ROOFING.
Murphy's Sons, C. P.

GREASE CUPS.
(See Lubricators.)

GRINDER—CARD, CYLINDER ROLL, NAPPER AND GARNET.
(See Card Grinding Machinery.)

GAUGES (WELDING).
Oxweld Acetylene Co.

GUARDS—ELECTRIC LAMP.
(See Electric Lamp Guards.)

GUARDS—MACHINE, SKYLIGHT, WINDOW, ETC.
Dowman, George.

GUIDES—THREAD.
Mitchell-Bissell Co.
Palmer Co., I. E.

GUMS.
(See Finishing and Sizing Materials.)

HACK AND BAND SAWS AND BLADES.
Racine Tool & Mch. Co.

HALFTONES—PRINTING.
Jacobs & Co.

HANGERS.
(See Shafting and Hangers.)

HANK CLOCKS.
(See Counters.)

HARDWARE—BUILDING.
Dowman, George.

HARNESS—LOOM.
(See Loom Harness.)

HARNESS TWINE.
Harris Co., Geo. W.

HEADS—BOBBIN AND SPOOL.
Lestershire Spool & Bobbin Co.
Parker Co., Walter L.
U S Bobbin & Shuttle Co.

HEATING AND VENTILATING APPARATUS.
(See Ventilating Apparatus.)

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Crompton & Knowles Loom Works.
Draper Corporation.
Howard Bros. Mfg. Co.
Reutlinger, J. J.
Steel Heddle Mfg. Co.
Walker Mfg. Co.
Williams Co., J. H.

HEDDLE FRAMES.
Crompton & Knowles Loom Works.
Gessner, David
Walker Mfg. Co.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HOISTS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.
Elwell-Parker Electric Co.
Fulton Supply Co.
Link-Belt Company.
Louden Mchry. Co.
Morse Chain Co.

HOPPER FEEDERS.
(See Automatic Feeders.)

HORNS AND MUSICAL INSTRUMENTS.
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Oxweld Acetylene Co.

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Franklin Process Co.
Philadelphia Drying Mchry. Co.

HOSIERY FORMS.
(See Drying Forms.)

HOSIERY YARNS.
(See Yarn Manufacturers.)

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Hotel Martinique.

HOUSES AND MILL COTTAGES (READY BUILT).
Minter Homes Co.

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American Blower Co.
Carrier Eng. Corp.
Parks-Cramer Co.

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Taylor Instrument Co.

HUMIDITY RECORDERS.
Foxboro Co., Inc., The.

HYDGRODEIKS.
Tayor Instrument Co.

HYGROMETERS.
Foxboro Co.
Taylor Instrument Co.

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Murdock Mfg. & Supply Co.

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(See Turbines—Hydraulic.)

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(See Extractors.)

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Westinghouse Elec. & Mfg. Co.
Root Co.
Taylor Instrument Co.

INDIGO.
(See Dyestuffs and Chemicals.)

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Corpus Christi Chamber of Commerce.
Georgia Railroad.
Nashville Industrial Corp.
Seaboard Airline Ry.
Southern Ry.
Tennessee Electric Power Co.

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Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

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Ryerson & Son, Inc., Jos. T.

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Cyclone Fence Co.
Dowman, George.
Dufur & Co.
Lombard Iron Works & Supply Co.
Piedmont Iron Works

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(See Spools.)

JACQUARDS.
Crompton & Knowles Loom Works.

JACQUARD HEDDLES.
Steel Heddle Mfg. Co.

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Wicaco Screw & Mch. Wks., Inc.

JOINT COMPOUND.
Dixon Crucible Co., Jos.

JUTE BAGGING MACHINE.
Proctor & Schwartz, Inc.

KETTLES—SIZE.
(See Size Kettles.)

KETTLES—SODA.
Lombard Iron Works & Supply Co.

KIERS.
(See Bleaching Kiers.)

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(See Cotton Cloth Commission Merchants and Dealers.)

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(See Washers—Cloth.)

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Franklin Needle Co.
General Machine Works.
Granite State Needle Co.
Hemphill Mfg. Co.
Scott & Williams.
Shardlow, J. W.
Torrington Co.
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Wildman Mfg. Co.
Williams, Chauncey A.

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Granite State Needle Co.
Williams, Chauncey A.

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Barber-Colman Co.
Mill Devices Co.

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Root Co.
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(See Belt Lacing.)

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Perry-Mann Electric Co.
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(See Electric Lamp Guards.)

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Cooper Hewitt Electric Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.
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Saco-Lowell Shops.
Whitin Machine Works.

LATHES.
Fulton Supply Co.

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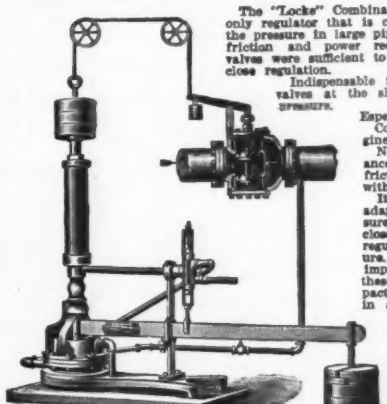

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Jacobs Mfg. Co., E. H.
Williams & Sons, I. B.

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(See Flood Lights.)

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(See Illuminating Engineers.)

LINEN YARNS.
(See Yarns—Linen.)

LINK BELTING.
(See Belting—Link.)

LINTERS.
(See Waste Dealers.)

LIQUID CHLORINE.
(See Chlorine.)

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Link-Belt Company.

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Allen Company.
Dowman, George.
Durabilt Steel Locker Co.
Mills Co.

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(See Dyestuffs and Chemicals.)

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Fletcher Works.
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Hopedale Mfg. Co.
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Schaum & Uhlinger.
Stafford Co.

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Hopedale Mfg. Co.

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Emmons Loom Harness Co.
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Harris Co., Geo. W.
Steel Heddle Mfg. Co.
Walker Mfg. Co.

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Jacobs Mfg. Co., E. H.

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N. Y. & N. J. Lubricant Co.

LUBRICATORS.
Bowser & Co., S. F.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.

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(See Straps—Lug.)

LUG STICKS.
Allen Co.

LUMBER.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

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(See Restaurant.)

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(See Guards—Machine.)

MACHINE TOOLS.
(See Tools.)

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Cresson-Morris Co.
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Piedmont Iron Works.
Wicaco Screw & Mch. Wks., Inc.

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Oxweld Acetylene Co.

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Harris Co., Geo. W.

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(See Yarn Manufacturers.)

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Amer. Yarn & Processing Co.
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Truscon Steel Co.

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Racine Tool & Mch. Co.

METAL SIDING.
Dowman, George.

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(See Screens and Sieves.)

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Foxboro Co., Inc.
General Electric Co.
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(See Counters.)

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(See Boxes—Mill.)

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(See Architects and Engineers.)

MILL VILLAGES.
(See Villages.)

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(See Paint.)

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Atlanta Brush Co.

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(See Theatre Equipment.)

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Perry-Mann Electric Co.
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(See Theatre Equipment.)

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(See Card Grinders.)

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(See Partitions.)

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N. Y. & N. J. Lubricant Co.
Wadsworth, Howland & Co., Inc.

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(See Engines Oil.)

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(See Finishing and Sizing Materials.)

OIL CUPS.
(See Lubricants.)

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Bradley Mfg. Co., A. J.

OIL PUMPS.
(See Pumps—Oil.)

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(See Separators.)

OIL TANKS.
Bowser & Co., Inc., S. F.

OILING DEVICES.
(See Lubricators.)

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Cooledge & Sons, F. J.
Detroit Graphite Co.
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Hascall Paint Co.
Hockaday Co.
Johnson & Co., Oliver.
Sonneborn Sons, Inc., L.
Truscon Laboratories.
Wadsworth, Howland & Co., Inc.
Warren Co.
Ware Paint Co.
Williams, C. L.

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(See Contractors.)

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(See Switchboards.)

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Mills Co.

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(See Screens and Sieves.)

PEROXIDES.
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(See Counters.)

PICKERS—CURLED HAIR.
Proctor & Schwartz, Inc.
Schofield Co., Wm.

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Graton & Knight Mfg. Co.
Jacobs Mfg. Co., E. H.

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(See Gears.)

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Whitin Machine Works.

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Washburn, Inc.

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(See Regulators—Pressure.)

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(See Dyers.)

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Jacobs & Co.
Showalter Printing Co., A. J.

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(See Blowers.)

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REGULATORS (DAMPER).
Locke Regulator Co.

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Fulton Co.
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(See Temperature Controllers.)

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(See Spinning Rings.)

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(See Bearings.)

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ROLLER CLOTH.
(See Cloth.)

ROLLER CONVEYORS.
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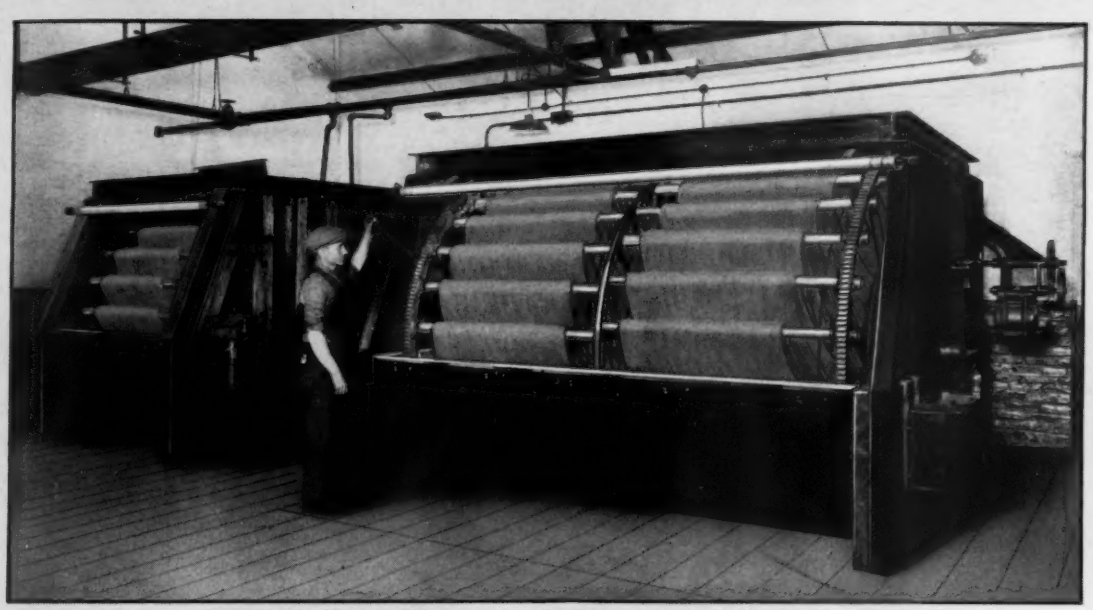
ROLLER LEATHER.
Bond & Co., Chas.



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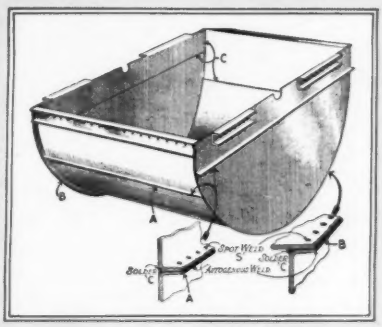

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In skein dyeing machines of all types, Monel Metal is used for many different parts. The tank itself, reels, shafts, propellers, stars, cups, dogs, springs and dye-sticks made of Monel Metal give notable satisfaction.

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So, when buying your next equipment specify Monel Metal. And in the meantime, write for "Textile Bulletin" and List B of available literature.

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The insidious blight, Corrosion, the red destroyer, Rust—they are at work all about you. In the water you drink, in the chemicals you use, and in the air you breathe. They shorten the life of most metals. They render others unfit for use. No wonder there is a demand—a vital need—for Monel Metal.

Monel Metal has been used for many varied types of equipment and construction because

—it will not rust,

—it is more generally resistant to corrosion than any other commercial metal,

—it does not contaminate food,

—its strength is not materially lessened by high temperatures,

—hot gases do not destructively oxidize its surfaces,

—its great strength enables it to withstand the wear of constant use.

Even when exposed to the spattering grease and dimming smoke of kitchens, Monel Metal is easy to keep spotless. Even when exposed to the deteriorating influence of most acids and hot gases, Monel Metal equipment stands up and continues to function. Even in hospital operating rooms, it furnishes an aseptically clean surface with a minimum of attention.

And in addition to being inherently clean and corrosion resisting, Monel Metal has the strength of steel. Therefore—always remember this! Equipment or construction fabricated of Monel Metal is built to last—it WILL endure.

Monel Metal can be machined, cast, forged, spun, punched, drawn, brazed, soldered and welded. Wherever it is used, wear and corrosion are largely prevented. To help solve your metal problems you may have the benefit of our experience. Write for List B of available literature.

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Monel Metal is a technically controlled Nickel-Copper alloy of high nickel content. It is mined, smelted, refined, rolled and marketed solely by The International Nickel Company. The name "Monel Metal" is a registered trade-mark.

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Washburn, Inc.

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Textile Finishing Mchy. Co.
Stowe & Woodward Co.

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Butterworth & Sons Co., H. W.
Southern Spindle & Flyer Co.
Textile Finishing Mchy. Co.
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Washburn, Inc.

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Washburn, Inc.

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Hascall Paint Co.
Kirkpatrick Lumber & Timber Co.
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Richardson Co.
Southern Wood Preserving Co.
Wadsworth, Howland & Co.

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Murphy's Sons, C. P.

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Whitin Machine Works.

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Stowe & Woodward Co.

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(See Finishing & Sizing Materials.)

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Vogel Co., Jos. A.

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(See Window Sash.)

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(See Musical Instruments.)

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(See Boiler Feed Water Purification.)

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Erdle Perforating Co.
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Mathieson Alkali Works.
Warren Soap Mfg. Co.

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Whitin Mch. Wks.

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Toomey, Frank, Inc.

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(See Harness.)

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Merrow Machine Co., The.
Textile Finishing Mchry. Co.

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Fulton Supply Co.
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Hyatt Roller Bearing Co.
Mills Co.

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Dowman, George.

SHINGLES (METAL).
Cortright Metal Roofing Co.
Dowman, Geo.

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Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

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Bradley Mfg. Co., A. J.
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Morris & Co., Inc.
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Toledo Scale Co.

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Mills Co.

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Draper Corporation.
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Shambow Shuttle Co.
U S Bobbin & Shuttle Co.
Williams Co., J. H.

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Judson Mills.
Meritzer, H. S.
Tubize Artificial Silk Co. of America.

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Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

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(See Industrial Sites.)

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Foxboro Co., Inc., The.

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(See Bleaching Kiers or Tanks.)

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(See Finishing and Sizing Materials.)

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Dowman, George.

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Birmingham Slag Co.

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Howard & Bullough.
Mossberg Pressed Steel Corp.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

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(See Cloth.)

SLASHER TAPE.
(See Tape—Slasher.)

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Barrett Co.

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Mills Co.

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Howard & Bullough.
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Whitin Machine Works.

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Lennig & Co., Chas.
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Newport Chemical Wks.
Rohm & Haas Co.
Sonneborn Sons, Inc., L.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

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(See Finishing & Sizing Materials.)

SOFTENERS—WATER.
(See Water Softeners.)

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Westinghouse Elec. & Mfg. Co.

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Roessler & Hasslacher Chem. Co.

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(See Finishing.)

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U S Bobbin & Shuttle Co.

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Reeves Pulley Co.

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(See Counters.)

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Wicaco Screw & Mch. Wks., Inc.

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(See Yarn Manufacturers.)

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Howard & Bullough.
Saco-Lowell Shops.
Schaum & Uhlinger.
Whitin Machine Works.

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Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

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Barber Mfg. Co.

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Foster Mch. Co.
Gessner, David
Mill Devices Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Whitin Machine Works.

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Brown Co., David.
Fulton Supply Co.
Jordan Mfg. Co.
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Mossberg Pressed Steel Corp.
Parker Co., Walter L.
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Textile Products Co.
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(See Paint Spray.)

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(See Tanks, Towers, Etc.)

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Morse Chain Co.

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Dixie Seal & Stamp Co.

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Ciba Co.
Corn Products Refining Co.
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Klipstein & Co., A.
Keever Starch Co
Mathieson Alkali Works, Inc.
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Staley Co., A. E.
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(See Engines—Steam.)

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(See Pumps—Steam.)

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(See Separators.)

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(See Traps—Steam.)

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Truscon Steel Co.

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Truscon Steel Co.

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Dowman, George.

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(See Marking Pots and Brushes.)

STENCIL CUTTING MACHINES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

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(See Picker Sticks.)

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(See Furniture—Mill.)

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Draper Corporation.
Eclipse Textile Devices, Inc.
Whitin Machine Works.
Wildman Mfg. Co.

STOKERS.
Vogt Brothers Mfg. Co.
Westinghouse Elec. & Mfg. Co.

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(See Shelving.)

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(See Tanks.)

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Garland Mfg. Co.
Graton & Knight Mfg. Co.
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(See Leather Specialties or Check Straps.)

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Howard Bros. Mfg. Co.

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(See Finishing & Sizing Materials.)

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Link-Belt Co.
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Williams & Sons, I. B.

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(See Office Equipment.)

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(See Brushes.)

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(See Playground Equipment.

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General Electric Co.
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Westinghouse Elec. & Mfg. Co.

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(See Furniture.)

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Root Co.

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(See Finishing Machinery.)

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Woolford Wood Tank Co., G.

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Bowser & Co., Inc., S. F.

TANKS (SPRINKLER).
Lombard Iron Works.
Rome Machine & Fdry. Co.
Woolford Wood Tank Co., G.

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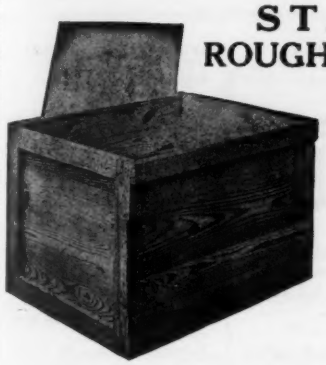
American Oil Pump & Tank Co.
Lombard Iron Works.
Rome Machine & Fdry. Co.
Walsh & Weidner Boiler Co.

TANKS (SEPTIC).
Davis Septic Tank Co.



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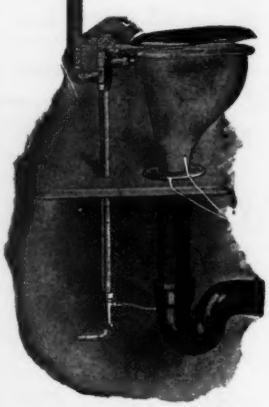

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LOWELL,
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Proctor & Schwartz, Inc.
Textile Finishing Mchry. Co.
Woolford Wood Tank Co., G.

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Gessner, David
Fletcher Works.
Schaum & Uhlinger.

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Barber Mfg. Co.
Weimar Brothers.

TAPES—SPINNING AND TWISTING.
Barber Mfg. Co.

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Taylor Instrument Co.

THERMOMETERS—RECORDING AND INDEX.
Foxboro Co.
Taylor Instrument Co.

THERMOSTATS.
Foxboro Co.

THIN PLACE PREVENTERS.
Draper Corporation.

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Palmer Co., The I. E.

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Richardson Co.

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(See Lumber.)

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(See Clocks.)

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(See Bale Ties.)

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Fletcher Works.

TOILETS.
Davis Septic Tank Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

TOILETS (SEPTIC TANK).
Davis Septic Tank Co.

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Dowman, George.
Mills Co.

TOOLS (MACHINE—HAND & ELECTRIC).
Fulton Supply Co.
Independent Pneumatic Tool Co.
Ryerson & Son, Inc., Jos. T.

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Durablit Steel Locker Co.
Mills Co.

TOOL STANDS—STEEL.
Mills Co.

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Howard Bros. Mfg. Co.

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Oxweld Acetylene Co.

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Kaumagraph Co.

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Kaumagraph Co.

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(See Power Transmission Machinery.)

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American Blower Co.
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Morehead Mfg. Co.

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Mathews Conveyor Co.

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Chisholm-Moore Mfg. Co.
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Elwell-Parker Electric Co.
Louden Mchry. Co.
Ryerson & Son, Inc., Jos. T.

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White Co.

TRUCKS, BASKETS, ETC.
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Haskins Co., R. G.
Morris & Co., Inc.
Smith Mfg. Co.
Washburn, Inc.

TRUCKS (BEAM).
Allen Company.

TRUCKS (ELECTRIC).
Elwell-Parker Electric Co.

TRUCKS (HAND & POWER) ....—INTER, ETC.
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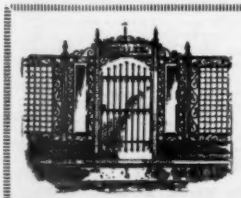

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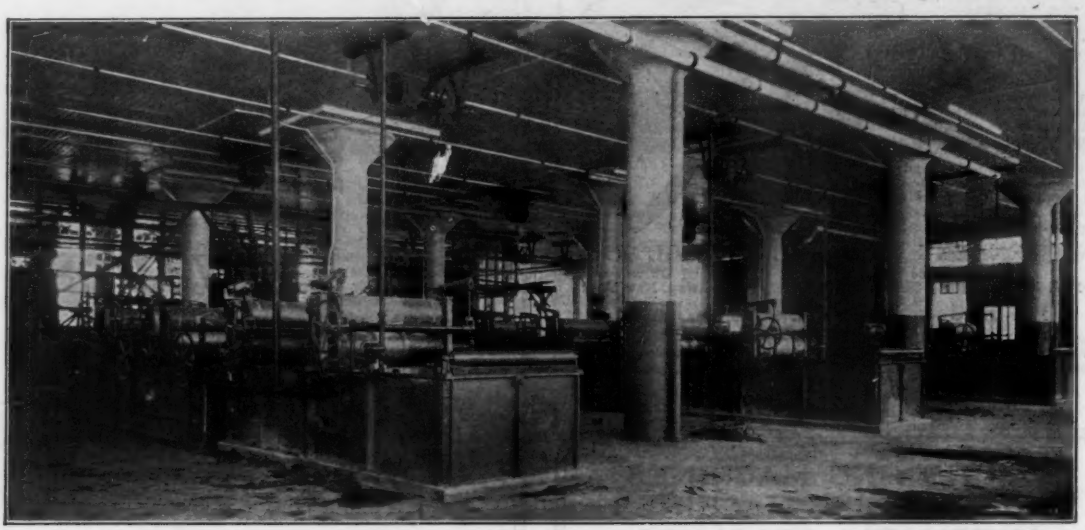

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THE WASHABLE PAINT FOR ALL INTERIORS

DU PONT DYESTUFFS

SULFANTHRENE PINK FF

The production of this dyestuff on a large scale constitutes a notable achievement of the du Pont Company. Sulfanthrene Pink FF compares most favorably with its prototype, Hydron Pink FF, being if anything, better in purity of shade, strength, solubility and dyeing properties.

It is offered in paste form particularly free of grit and other impurities for the piece dyer and printer. Sulfanthrene Pink FF is also available in powder form, being standardized to double the paste strength.

This powder product corresponds in all properties to the paste color and is prepared so as to dissolve easily and in a manner similar to the paste. The many advantages of using the dye in powder form will be apparent to dyers, and to all occasional users of vat colors.

Stocks and current production of this dyestuff are sufficient to amply take care of the needs of the country.

E. I. DU PONT DE NEMOURS & CO., INC.

Dyestuffs Department

WILMINGTON DELAWARE

STANDARD-UNIFORM